HANDBOUND
AT THE

UNIVERSITY OF
TORONTO PRESS

34

TRANSACTIONS

OF THE

HISTORIC SOCIETY

OF

LANCASHIRE AND CHESHIRE.

Royal Astronomical Society.

NEW SERIES—VOLUME III.

SESSION 1862-63.

LIVERPOOL:
ADAM HOLDEN, 48, CHURCH STREET.

1863.

DA
670
L19H6
v.15

7864

LIVERPOOL:
T. BRAKELL, PRINTER, COOK STREET.

This Volume has been edited by the Assistant Secretary, under the direction of the Council. The Writers of Papers, however, are alone responsible for the facts and opinions contained in their respective communications.

EXPLANATORY NOTE.

Plate V is printed at the expense of the Society, from a drawing on the stone by Mr. Gregson; the Hilbre Cross and ancient Crotal are lent by the Rev. A. Hume, D.C.L., the Honorary Secretary. All the other Illustrations are furnished at the Society's expense, from original drawings or materials supplied by the respective authors.

COUNCIL AND OFFICERS FOR 1862-3.

President.

Lieut.-General the Hon. Sir EDWARD CUST, K.C.H., D.C.L., Leasowe Castle.

Vice-Presidents.

EX OFFICIIS.	ELECTED.
THE MAYOR OF LIVERPOOL.	COLONEL SIR W. BROWN, Bart.
THE HIGH SHERIFF OF LANCASHIRE.	JOSEPH MAYER, F.S.A.
THE HIGH SHERIFF OF CHESHIRE.	JAMES CROSSLEY, F.S.A.

Sectional Members* of Council.

ARCHÆOLOGY.	LITERATURE.	SCIENCE.
J. A. FORREST, Esq.	H. BAAR, Ph.Dr.	G. M. BROWNE, Esq.
G. J. FRENCH, F.S.A.	H. GERARD, Esq.	J. HARTNUP, F.R.A.S.
J. KENDRICK, M.D.	Rev. J. S. HOWSON, D.D.	N. MERCER, F.C.S.
P. R. M'QUIE, Esq.	J. R. HUGHES, Esq.	T. SANSOM, F.B.S.E.
J. F. MARSH, Esq.	W. MATHISON, Esq.	J. T. TOWSON, F.R.G.S.
C. B. ROBINSON, Esq.	Rev. T. MOORE, A.M.	N. WATERHOUSE, Esq.

Librarian.

DAVID BUXTON, F.R.S.L., 52, Oxford Street, Liverpool.

Curator.

A. CRAIG GIBSON, F.S.A., Stonesfield, Bebington, Birkenhead.

Treasurer.

W. BURKE, Esq., 17, Bagot Street, Smithdown Road, Liverpool.

Hon. Secretary.

Rev. A. HUME, D.C.L., LL.D., 24, Clarence Street, Everton, Liverpool.

Assistant Secretary.

J. H. GENN, Esq., 9, Sugnall Street, Liverpool.

---

* In accordance with Law XX the Council added the three elected Vice Presidents, the Librarian and the Curator to all the Sectional Committees.

CONTENTS.

[Papers marked thus * are *illustrated.*]

PAGE.

*On Virgil's Plough, as illustrated by a rude Implement in modern use in Spain. By J. F. Marsh, Esq. 1

On the Life and Writings of Schiller. By the Rev. Hermann Baar, Ph.Dr. 21

On Micro-Geology. By Edward H. Birkenhead, F.G.S..... 41

Every-day Life of a Country Gentleman of Cheshire in the 17th Century; as shewn in the Private Expenditure Journal of Colonel Henry Bradshaw, of Marple and Wybersleigh. By A. Craig Gibson, F.S.A., Hon. Curator 67

List of the British Roses and Brambles occurring in the Liverpool District. By Mr. H. S. Fisher..... 93

On the Habitats of some of our British Ferns. By Nicholas Waterhouse, Esq. 97

*An Account of the Life and Writings of the late Henry Buckley. By T. T. Wilkinson, F.R.A.S., &c..... 115

On the Scarcity of Home-Grown Fruits in Great Britain; with Remedial Suggestions. By C. Roach Smith, F.S.A. &c... 129

*On the Typical Quadrumana; with especial reference to St. Hilaire's Division into Catarrhine and Platyrrhine Groups. By Cuthbert Collingwood, M.B., F.L.S., Hon. Sec. to the Liverpool Literary and Philosophical Society. 141

Popular Rhymes and Proverbs connected with Localities. Second Series. By A. Craig Gibson, F.S.A., Hon. Curator 159

*Local Chit-Chat of the "Forty-Five." By Lieutenant-General the Hon. Sir Edward Cust, D.C.L., President 179

*Notes on Insects injurious to Fruit and Forest Trees. By Mr. C. S. Gregson (late President of the Northern Entomological Society) 203

On the Applications of Electricity. By E. B. Bright, F.R.A.S. 223

PAGE.

Original Letter, giving a contemporary Relation of the Death of Charles II. Communicated by Lieut.-General the Hon. Sir E. Cust, President 231

The Hilbre Cross. By the Rev. A. Hume, D.C.L., Hon. Sec. 233

List of Members vii

Proceedings, Fifteenth Session 235

Report presented at Annual Meeting ..... *ib.*

Treasurer's Balance Sheet 238

Annual Excursion 262

LIST OF ILLUSTRATIONS.

PAGE.

I, Spanish and other Ploughs ..... to face 1

IA, Geometrical Figures ..... „ 120

II, Typical Quadrumana ..... „ 145

III, Ditto ..... „ 153

IV, Claymore of Prince Charles Edward ..... see 202

V, Insects and sections of injured Trees ..... to face 222

VI, Photogram of the Moon ..... „ 257

SMALL WOODCUTS &c. :—

Fac-simile of Colonel Henry Bradshaw's Signature 92

Typical Quadrumana, various 152, 157, 158

The Hilbre Cross 233

Ancient Crotal 240

Messe-dag Stave, from the Society's Museum 259

LIST OF MEMBERS.

SESSION XV, 1862-63.

The first List was dated 23rd November, 1848; all whose names appeared in it are therefore Original Members. Those who have been enrolled as Mayors or Sheriffs have their year of office attached.

The letter P denotes that the Members in connexion with whose names it occurs have read papers before the Society.

Those whose names are printed in SMALL CAPITALS are Members of the Council and in *italics* are Life Members.

Those marked thus * are Resident. The post town Liverpool is usually omitted.

A

23rd Nov., 1848. *Ainslie, Montague*, Grizedale, Hawkshead, Windermere.
1st Dec., 1859. Ainslie, P. B., F.S.A. Scot., Guildford.
4th Dec., 1862. *Anderson, John, 42, Bold street.
17th Dec., 1857. *Anderson, Thomas Darnley, 5, India buildings, Water street, and 37, Northumberland terrace, Everton.
3rd May, 1849. *Anderson, Thomas Francis, Holly lodge, Fairfield. and 3, Cable street.
4th Dec., 1856. Ansdell, John, St. Helens.
23rd Nov., 1848. Ansdell, Richard, A.R.A., Lytham house, St. Alban's road, Kensington, W., London.
15th Sept., 1854. Arrowsmith, P. R., The Ferns, Bolton.
2nd Dec., 1858. Artingstall, George, Warrington.
P. 4th Dec., 1862. Ashfield, Charles Joseph, 9, Regent street, Preston
P. 11th May, 1854. Aspland, Rev. R. Brook, M.A., Frampton villas, South Hackney, London.
P. 9th Oct., 1854. Atherton, Henry, Sutton, Prescot.
H.Sh.Cheshire, 1857. *Atkinson, William*, Ashton heyes, Chester.
23rd Nov., 1848. *Avison, Thomas, F.S.A., 18, Cook street, and Fulwood park, Aigburth.

B

3rd Jan., 1861. *BAAR, REV. HERMANN, Ph.Dr., 15, Sandon street.
1st Nov., 1860. *Bairstow, W., Dale street.
8th June, 1854. *Banning, John Johnson, 20, Castle street.
P. 4th Dec., 1862. Barry, Rev. W. T., B.A., Rainford, St. Helen's.
7th Feb., 1861. *Bartlett, William, 22, North John street.
12th Jan., 1860. *Bath, William H. P., 54, Grove street.
6th March, 1862. *Bazley, Thomas*, M.P., Hayesleigh, Manchester and Reform Club, London, S.W.
P. 6th Dec., 1849. Beamont, William, Warrington.
21st May, 1857. *Bean, Edwin, Revenue buildings.
15th April, 1858. *Bell, Christopher, Back Goree.

23rd Nov., 1848. *Bell, Henry, Hamilton square, and Grosvenor road, Claughton, Birkenhead.
15th Nov., 1854. *Belshaw, John, Wason buildings, 4, Harrington st.
23rd Nov., 1848. *Bennett, William, Sir Thomas's buildings, and 109, Shaw street.
3rd Dec., 1857. Berry, Percival.
7th March, 1850. Birch, Sir Thomas Bernard, Bart., The Hazles, Prescot.
23rd Nov., 1848. Birchall, Major Thos., Ribbleton hall, Preston.
P. 1st May, 1862. Birkenhead, E. H., B. Sc., F.G.S., Worsley mesnes, Wigan.
4th March, 1852. Birley, Rev. John Shepherd, Halliwell hall, Preston.
P. 8th Jan., 1852. Birley, T. Langton, Carr hill, Kirkham.
19th April, 1860. *Birnie, D. E.
6th Dec., 1855. Black, J., M.D., F.G.S., 2, George's square, Edinburgh.
23rd Nov., 1848. Blackburne, John Ireland, The Hall, Hale.
20th Sept., 1854. Blackmore, William, 10, Water street, and Hooton, Chester.
20th Sept., 1854. *Bloxam, Frederick William.
23rd Nov., 1848. *Blundell, Thomas Weld, Ince Blundell, Great Crosby.
5th May, 1853. Booth, Benjamin Witham, Swinton, Manchester.
1st May, 1856. Booth John Billington, Overleigh house, Preston.
15th Dec., 1853. Bossi, Arthur, Paris.
31st Sept., 1854. Bostock, Rev. H., M.A.
3rd Jan., 1856. *Bouch, Thomas, 1, Oldhall street, and New Brighton.
23rd Nov., 1848. *Boult, Francis, Richmond buildings, and Devonshire road, Claughton.
P. 23rd Nov., 1848. *Boult, Joseph, North John street, and Parkfield road, Aigburth road.
8th Dec., 1851. Bourne, Cornelius, Stalmine hall, Preston.
15th April, 1858. *Bowers, Anthony, Vauxhall foundry.
6th Dec., 1855. Bowes, John, Blue Coat School, Warrington.
13th Nov., 1851. Brackstone, R. H., Lyncombe hill, Bath.
15th Dec., 1853. Bradbury, Charles, Salford crescent, Manchester.
17th Dec., 1857. *Bradley, William Gibson, 52, Bold street, and 18, Kenyon terrace, Birkenhead.
23rd Nov., 1848. *Brakell, Thomas, 7, Cook street, and 23, Richmond terrace, Everton.
Mayor Liv., 1848-9. *Bramley-Moore, John, M.P., Hon. Mem. Archæol. Association, Aigburth.
30th Dec., 1854. Brent, Francis, Custom house, Plymouth.
P. 7th May, 1863. *Bright, E. B., 2, Exchange buildings, and Waterloo.
P. 9th March, 1854. *Bright, Henry Arthur, A.M., Fairfield, and 1, North John street.
3rd May, 1849. Brooke, Henry, Forest hill, Northwich.
6th March, 1851. *Brooke, Richard, jun.*, Norton priory, Runcorn.
23rd Nov., 1848. **Brown, Colonel Sir William*, Bart., Richmond buildings, Chapel street, and Richmond hill, Vice-President.

15th March, 1855. *Browne, G. Mansfield, 15, South hill, Park road.
11th Sept., 1854. *Burke, William, 17, Bagot street, Smithdown road, Treasurer.
17th Sept., 1854. Burnell, Rev. Samuel, A.M., Winwick, Warrington.
P. 15th Dec., 1853. *Buxton, David, F.R.S.L., Principal of the Liverpool Deaf and Dumb Institution, Oxford street, Librarian.

C

23rd Nov., 1848. *Caine, Nathaniel, 12, Dutton street.
3rd Dec., 1857. *Calder, Rev. William, A.M.
1st Dec., 1859. Callender, W. Romaine, jun., F.S.A., Ashburne house, Rusholme, Manchester.
P. 6th Dec., 1855. Calvert, F. Crace, Ph.Dr., F.R.S., F.C.S., M.R.A. Turin, Royal Institution, Manchester.
23rd Nov., 1848. *Campbell, Rev. Augustus, A.M., 131, Duke street, and The Vicarage, Childwall.
18th Dec., 1856. *Campbell, Captain William, R.L.A.
4th April, 1850. *Carlisle, His Excellency the Earl of*, K.G., Castle Howard, Yorkshire, and The Castle, Dublin.
18th Dec., 1856. Cartwright, Samuel, Bushell place, Preston.
6th Dec., 1859. *Casson, William, 39, Parliament street, and 3, Great George square.
27th Sept., 1854. *Casey, George, Naylor street, and Walton.
3rd Dec., 1857. *Chadburn, Charles Henry, 71, Lord street, and Egremont, Birkenhead.
H.Sh.Chesh., 1855-6. *Chapman, John*, M.P., Hill End, Mottram-in-Longdendale.
21st May, 1857. Cheetham, John, Eastwood, Stalybridge.
Cheshire, the High Sheriff of, Vice-President, *ex officio*.
2nd June, 1853. *Chester, The Lord Bishop of*, The Palace, Chester.
23rd Nov., 1858. *Clare, John Leigh, 11, Exchange buildings, and Richmond terrace, Breck road.
14th April, 1859. *Clement, Leonard*, Trinity terrace, Burnley.
17th Dec., 1857. Coates, Rev. W. H., Neston, Cheshire.
10th Nov., 1854. Colston, Rev. John, Quarry bank, Wilmslow, Manchester.
24th May, 1855. Comber, Thomas.
23rd Nov., 1848. *Conway, John, Cable street.
18th Dec., 1856. Corser, Rev. Thomas, A.M., Stand, Manchester.
23rd Nov., 1848. Coulthart, John Ross, F.S.A., Scot., Croft house, Ashton-under-Lyne.
4th Dec., 1862. Cranborne, Rt. Hon. Viscount, Childwall hall.
6th Dec., 1849. *Crosfield, Henry, 4, Temple place, and Edge mount, Edge lane.
9th Jan., 1862. Cross, Richard Assheton, Warrington.
23rd Nov., 1848. Crosse, Thomas Bright, Shawe hill, Chorley.
2nd May, 1850. Crossley, James, F. S. A., President of the Chetham Society, 6, Booth street, Piccadilly, Manchester, Vice-President.
P. 23rd Nov., 1848. *Cust, Lieut.-Gen. the Hon. Sir Edward, K.C.H., D.C.L., F.R.S., Leasowe Castle, Cheshire, Claremont, Surrey, and Hill street, London, President.

D

8th Dec., 1851. Dale, Rev. Peter Steele, A.M.
23rd Sept., 1854. *Davies, Comenius, 110, Paddington, Edge hill.
6th March, 1856. Daw, Robert, F.B.S.E., &c.
19th March, 1863. Dawson, E., Aldcliffe hall, Lancaster.
23rd Nov., 1848. **Dawson, Henry*, 30, Redcross street, and 14, St. James's road.
2nd May, 1850. *Dawson Thomas, 26, Rodney street.
23rd Nov., 1848. Dearden, James, F.S.A., Rochdale Manor, Lancashire, and Upton house, Poole.
23rd April, 1857. *Devonshire, The Duke of*, K.G., D.C.L., F.R.S., Chatsworth, Derbyshire, and Devonshire house, London.
7th May, 1851. **Dickinson, Joseph*, M.A., M.D., F.R.C.P., F.R.S., F.L.S., M.R.I.A., 92, Bedford street South.
P. 20th Dec., 1855. Dobson, William, Chronicle office, Preston.
P. 7th March, 1853. *Dove, Percy M., F.S.S., F.I.A., Royal Insurance office, 1, North John street, and Castledon lodge, Claughton road, Birkenhead.
4th Nov., 1858. *Drysdale, C. Alexander, 11, King street, and 7, Elm terrace, Fairfield.
23rd Nov., 1848. *Duarte, Ricardo Thomaz, 2, Royal bank buildings.
13th Sept., 1854. *Duncan, Thomas, 44, West Derby street.

E

1st Jan., 1857. *Eaton, Francis James, Richmond terrace, Breck road, and 18, Queen Insurance buildings.
9th Dec., 1852. Eckersley, Thomas, Wigan.
6th March, 1862. *Edwards, Edward, Tue Brook, West Derby.
6th March, 1862. Egerton, Hon. Algernon, M.P., Worsley Old hall, Manchester.
7th Jan., 1851. *Egerton, Hon. Wilbraham*, M.P., Rostherne hall, Knutsford.
6th March, 1862. *Egerton of Tatton, Rt. Hon. the Lord*, Tatton park, Knutsford.
P. 23rd Nov., 1848. *Egerton, Sir Philip De Malpas Grey*, Bart., M.P., F.R.S., F.G.S., Oulton park, Tarporley.
23rd Nov., 1848. *Evans, Edward, 56, Hanover street.
4th Nov., 1858. *Evans, Edward Francis, Church road, Stanley.
8th Nov., 1849. *Evans, Thomas Bickerton, 56, Hanover street.
23rd Nov., 1848. *Ewart, Joseph Christopher, M.P., 64, Pall Mall, London, and New Brighton.
6th May, 1852. *Ewart, William*, M.P., 6, Cambridge square, Hyde park, London, and Broadleas, Devizes.

F

7th Feb., 1861. *Fabert, J. O. W., 3, St. James's walk.
3rd Dec., 1857. Fairbairn, William, F.R.S., Manchester.
23rd Nov., 1848. *Finlay, William, Collegiate Institution.
15th April, 1858. *Forrest, J. A., 58, Lime street, and 5, Charlesville, Claughton, Birkenhead.
5th Dec., 1850. *Forster, Wilson, New Ferry terrace, Rock Ferry, and 23, Temple street.
6th March, 1862. *Fort, Richard*, Woolley hall, Maidenhead, and Read hall, Clitheroe.

23rd Sept., 1854. *Forwood, T. B., 11, Dale street, and The Hollies, Fairfield.
7th May, 1857. *Frackleton, Rev. S. S.*, A.M., Ballynahinch, Ireland.
15th Dec., 1853. Franks, Augustus Woollaston, A.M., F.S.A., British Museum, London.
6th Jan., 1853. *French, Gilbert James*, F.S.A., Corr. Mem. S.A. Scot., Bolton. (MEMBER OF THE COUNCIL.)
7th Jan., 1858. Frost, Meadows, 25, The Albany, Oldhall street, and St. John's house, Chester.

G

14th Dec., 1848. *Gardner, Richard Cardwell, Colonial buildings, 34, Dale street, and Newsham house.
3rd May, 1849. Garnett, Wm. James, M.P., Bleasdale tower, Garstang.
23rd Nov., 1848. *Gaskell, John Rooth, Exchange court, Exchange street East.
7th Feb., 1859. *Gath, Samuel, 45, Shaw street, Everton.
18th Dec., 1856. *GERARD, HENRY, 10, Rumford place.
P. 20th Nov., 1856. *GIBSON, A. CRAIG, Lower Bebington, Birkenhead, CURATOR.
1st May, 1862. *Gibson, J. H., 144, Vauxhal road.
7th March, 1850. *Gill, Robert.
6th March, 1862. *Gladstone, Rt. Hon. W. E.*, M.P., Chancellor of the Exchequer, 11, Carlton terrace, London, S.W.
3rd Dec., 1857. Gleadowe, Rev. R. W., A.M., Neston Vicarage, Cheshire.
15th April, 1858. *Glover. John, 26, Hanover street.
4th Dec., 1862. *Goodier, Thomas, 9, Lord street.
9th Dec., 1852. *Graves, Samuel Robert, 13, Redcross street.
21st Sept., 1854. Gray, Rev. R. H., A.M., Kirkby, Prescot.
14th Dec., 1848. Gray, Thomas, Manager and Secretary, Unity Insurance office, London.
6th Feb., 1851. Gray, William, M.P., Darcy Lever hall. Bolton.
2nd Dec., 1858. *Greame, Malcolm, Colonial buildings, Dale street.
4th Dec., 1862. Green, John Henry, Buenos Ayres.
16th Sept., 1854. *Green Thomas, Richmond buildings, Chapel street.
23rd Nov., 1848. Greenall, Rev. Richard, A.M., Incumbent of Stretton, R.D., Stretton, Warrington.
16th Sept., 1854. Greene, John Stock Turner, Adlington hall, Chorley.
31st Aug., 1854. Grenside, Rev. William Bent, A.M., Melling Vicarage, Lancaster.
19th March, 1857. *Grimmer, W. Henry, Delta chambers, Cable street.
13th March, 1862. Grosvenor, Rt. Hon. the Earl, M.P., Calveley, Tarporley.
8th Nov., 1849. *Guyton, Joseph, Derwent road, Stoneycroft.

H

21st May, 1857. *Hall, Charlton R., 19, Dale street, and Liscard castle, Birkenhead.
1st May, 1862. **Hall, J. J.*, 28, London Road.

10th Dec., 1857. *Hancock, Thomas S., Sweeting street, and Birkenhead.
P. 6th March, 1856. Hardwick, Charles, Preston, and 100, City road, Manchester.
12th Jan., 1854. *Harrison, William*, F.S.A., F.G.S., &c., Galligreaves hall, Blackburn.
9th Dec., 1852. *Harrison, Henry Walter.
9th Feb., 1854. *Harrowby, Rt. Hon. the Earl of*, D.C.L., F.R.S., Sandon hall, Staffordshire, and 39, Grosvenor square, London.
23rd April, 1857. *Hartington, Most Noble the Marquess of*, M.P., Chatsworth, Derbyshire, and Devonshire house, London.
10th Feb., 1853. **Hartley, John Bernard*, The Grove, Allerton.
P. 11th Oct., 1854. *Hartnup, J., F.R.A.S., Observatory.
23rd Nov., 1848. Hawkins, Edward, F.R.S., V.P.S.A., F.L.S., British Museum, London.
27th Sept. 1854. *Healey, Samuel R., 48, Castle street, and Westbank, Woolton.
24th Oct., 1854. Heginbottom, George, Albert terrace, Ashton-under-Lyne.
11th May, 1854. Henderson, Ebenezer, LL.D.
8th May, 1856. *Henderson, William, 13, Church street, and Rock park, Birkenhead.
23rd Nov., 1848. *Heywood, James*, F.R.S., F.S.A., F.G.S., 26, Kensington Palace gardens, London, W.
23rd Nov., 1848. *Heywood, Sir Benjamin*, Bart., F.R.S., F.S.S., Claremont, Manchester.
P. 23rd Nov., 1848. *Heywood, Thomas*, F.S.A., Hope end, Ledbury, Herefordshire.
P. 4th Jan., 1849. *Hibbert, Thomas Dorning, 39, Sackville street, Everton.
P. 23rd Nov., 1848. Higgin, Edward.
P. 12th Sept., 1854. Higgins, Rev, Henry H., A.M., Rainhill.
P. 23rd Nov., 1848. Hill, Rev. John Wilbraham, M.A., Waverton, Cheshire.
P. 21st Sept., 1854. Hill, Samuel, Chillington works, Wolverhampton.
26th April, 1855. *Hinde, Rev. Edmund, A.M., 36, Hope street.
P. 8th Dec., 1851. Hinde, John Hodgson, Stelling hall, Newcastle-upon-Tyne.
23rd Sept., 1854. *Hindmarsh, Fred.*, F.G.S., F.R.G.S., Bucklersbury, London.
12th Jan., 1860. *Holden, Adam, 48, Church street.
18th Dec., 1856. *Holden, Thomas*, Springfield, Bolton.
13th Feb., 1862. Holt, Charles, Beech house, Sharples, near Bolton.
24th Sept., 1854. *Holt, William D., 23, Edge hill.
10th May, 1860. *Hornby, Gerard, 177, Breck road, and 36, South Castle street.
7th May, 1857. *Horner, W., 34, South Castle street, and Eldon house, Oxton.
23rd Nov., 1848. *Horsfall, Thomas Berry, M.P., Bellamour hall, Staffordshire.
6th Dec., 1860. *Houghton, James, 84, Rodney street.
14th April, 1853. **Houghton, Richard H., jun.*, Sandheys, Waterloo.

4th Dec., 1856. *Howell, Edward, 6, Church street.
Mayor La. 1849-50. Howitt, Thomas, Lancaster.
P. 8th Nov., 1849. *Howson, Rev. John Saul, D.D., Principal of the Collegiate Institution.
27th Sept., 1854. *Hubback, Joseph, 1, Brunswick street, and Aigburth.
P. 10th Dec., 1857. *Hughes, John R., 67, Rock view, South hill road.
14th Sept., 1854. *Hughes, Joseph, 2, Upper Duke street, and 9, Brownlow hill.
16th Sept., 1854. *Hughes, J. B., 5, Wesley place, and 4, Clayton square.
6th April, 1854. Hughes, Thomas, 2, Groves terrace, Chester.
8th Feb., 1862. Hulton, William Adams, Hurst grange, Preston.
Mayor Ch. 1851-52. Humberston, Philip Stapleton, M.P., Chester.
P. 23rd Nov., 1848. *Hume, Rev. Abraham, D.C.L., LL.D., F.S.A., F.R.S. North Ant. Copenhagen, Corr. Mem. S.A. Scot., Hon. Mem. of the Society of Antiquaries, Newcastle-upon-Tyne, 24, Clarence street, Everton, Hon. Secretary.
21st May, 1857. *Hume, Hamilton*, F.R.G.S., Cooma, Yass, New South Wales.
6th Jan., 1859. *Hunt, Richard, 9, Castle street, and Linacre Marsh, Bootle.
9th Dec., 1853. *Hutchison, Robert, 12, Sweeting street, and 6, Canning street.

J

1st April, 1852. *Jacob, John Gibborn, 56, Church street.
5th Dec., 1861. *Jackson, William, Bedford road, Rock Ferry.
23rd Nov., 1848. Jacson, Charles R., Barton lodge, Preston.
15th April, 1858. *Jago, J. R., Revenue buildings, and 37, Upper Canning street.
2nd May, 1861. *Jeffery, F. J., Lodge lane.
21st May, 1857. *Jeffery, James Reddecliff, 45, Church street, and 11, Lodge lane.
23rd Nov., 1854. *Jeffery, Wiliam Reddecliff, 45, Church street, and 15, Deane street.
23rd Nov., 1848. Johnson John H., 7, Church street, and Southport.
23rd Sept., 1854. Jones, Edward, The Larches, Handsworth.
3rd Jan., 1861. *Jones, George, 36, Hanover street.
3rd May, 1849. *Jones, Morris Charles, 75, Shaw street.
2nd Dec., 1858. *Jones, Robert, 7, Batchelor street.
6th Dec., 1849. *Jones, Roger L., 1, Belvedere road, Prince's park.
15th Sept., 1854. Jones, Thomas, B.A., Chetham Library, Manchester.
11th Dec., 1856. Jones, W. Hope, Hooton, Chester.

K

5th Dec., 1861. Kendall, John, Fishergate, Preston.
23rd Nov., 1848. Kendall, Thomas.
P. 3rd May, 1849. Kendrick, James, M.D., Warrington.
11th Dec., 1856. Kershaw, James, M.P., Oaklands, Victoria park, Manchester.

4th Dec., 1862. *King, Lieut.-Col. Vincent Ashfield, 18, Tower chambers, and Point of Ayr, Oxton.
21st May, 1857. *Kitchen, Joseph, Exchange street East, and Oak house, West Derby.

L

6th March, 1862. *Laird, John, M.P., Hamilton square, Birkenhead.
14th March, 1852. *Lambert, David Howe.
LANCASHIRE, THE HIGH SHERIFF OF, VICE-PRESIDENT *ex officio*.
23rd Nov., 1848. Langton, William, Manchester.
21st Sept., 1854. *Lea, James, Surveyor, Egremont, Cheshire.
23rd Nov., 1848. Legh, G. Cornwall, M.P., High Legh, Knutsford.
1st Dec., 1859. *Legh, W. J.*, M.P., Lyme park, Disley, Stockport.
10th Dec., 1857. *Leigh, Major Egerton*, The West hall, High Leigh, Knutsford.
15th April, 1858. Leithead, H. F., Malpas, Truro.
4th March, 1858. Lindsay, Right Hon. the Lord, M.P., Haigh hall, Wigan.
23rd Nov., 1848. Lingard, Alexander Rowson, Hooton, Chester.
*LIVERPOOL, THE MAYOR OF, VICE-PRESIDENT, *ex officio*. (R. Hutchison, Esq.)
14th Dec., 1848. *Lloyd, John Buck.
6th Jan., 1853. *Longton, John, Peter's place, Rumford street, and Breck road.
P. 23rd Nov., 1848. *Lord, Capt. Wm.*, R.N., Southdown, Weymouth.

M

6th March, 1862. McCorquodale, Leiut.-Col. G., Newton-le-Willows.
14th Feb., 1861. McGill, Robert, Copperas hill, St. Helen's.
15th April, 1858. *McInnes, J., 26, Lightbody street.
P. 3rd March, 1853. *Macintyre, Peter, M.D., 56, Canning street.
27th Sept., 1854. *Macfie, Robert Andrew, 30, Moorfields, and Ashfield hall, Neston.
21st May, 1857. McNicholl, David Hudson, M.D., Southport.
23rd Nov., 1848. *M'QUIE, PETER ROBINSON, 9, Brunswick street, and Thornton lodge, Merton road, Bootle.
5th May, 1853. **Macrae, John Wrigley*, 22, Hackin's hey, and Seaforth house, Seaforth.
6th Dec., 1849. *M'Viccar, Duncan, Abercromby square, and 7, Exchange buildings.
3rd Jan., 1849. *Manchester, The Lord Bishop of*, F.R.S., F.G.S., Mauldeth hall, Manchester.
23rd Nov., 1848. Markland, James Heywood, D.C.L., F.R.S., F.S.A., Lansdowne crescent, Bath.
23rd Nov., 1848. *Marsden, George, Vernon priory, Edge hill.
1st Dec., 1859. Marsh, John, Rann lea, Rainhill.
P. 5th June, 1851. MARSH, JOHN FITCHETT, Fairfield house, Warrington.
9th March, 1854. *Mason, William Ithell.
6th March, 1862. *MATHISON, WM., 1, Adelaide terrace, Waterloo.
15th April, 1858. Mawdesley, H., Southport.

P. 23rd Nov., 1848. *Mayer, Joseph, F.S.A., M.R., Asiat., S., F.E.S., F.R.S. North Ant. Copenhagen, Associé étranger de la Société Impériale des Antiquaires de France, Hon. Mem. SS. Anti., Normandie, l'Ouest, la Morinie, Société d'Emulation d'Abbeville, &c., 68, Lord street, Vice-President.

17th Feb., 1850. Mayer, Samuel, Newcastle-under-Lyne.

10th Feb., 1859. Meaden, Henry Peter, F.C.S., Haslingden.

P. 15th April, 1858. *Mercer, Nathan, F.C.S., 7, Church street.

P. 6th Dec., 1849. Middleton, Captain James, F.S.A.

2nd Jan., 1862. Milligan, James, jun., Longview, Huyton.

21st Feb., 1861. Mills, John, Middle School, Warrington.

10th May, 1860. Mills, Robert, F.S.A., F.G.S., 27, Promenade, Rochdale.

P. 21st Dec., 1854. *Milner, William, 322, Upper Parliament street, and Phœnix Safe Works, Windsor.

P. 1st Dec., 1859. *Mitchell, T. R., M.D., 20, Bedford street South.

3rd Dec., 1857. Moore, Rev. Richard R., B.A., Harworth, Rotherham.

P. 8th Nov., 1849. Moore, Rev. Thomas, A.M., Cork.

18th Dec., 1856. Moseley, Thomas Beeby.

15th April, 1858. *Moss, J. B., 34, West Derby street.

P. 23rd Nov., 1848. *Moss, Rev. John James, A.M., Upton, Cheshire.

P. 7th March, 1850. *Mott, Albert J., 21, South Castle street, and Holt hill, Birkenhead.

3rd Dec., 1857. *Moult, William, 21, Leigh street, and Knowsley.

21st May, 1857. *Mozley, Charles, Beaconsfield, Woolton.

11th Dec., 1856. Myres, John James, Bank parade, Preston.

N

H.S. Ches., 1857. *Naylor, Richard*, Hooton, Cheshire.

23rd Nov., 1848. *Neill, Hugh, F.R.A.S., L.R.C.P., 2, Bedford street South.

15th April, 1858. *Newlands, J., Public Offices, Cornwallis street.

19th March, 1863. Newsham, Richard, Preston.

P. 6th Dec., 1855. *Newton, John, M.R.C.S., 13, West Derby street.

23rd Nov., 1848. Nicholson, James, F.S.A., Thelwall hall, Warrington.

6th March, 1862. *Norbury, Richard, Elm vale, Fairfield.

29th Sept., 1854. *Nottingham John, M.D., F.R.A.S., F.R.S., Northern Antiquaries, Copenhagen, 20, Roscommon street.

O

2nd Jan., 1851. *Oates, Captain W. C.*, Cavendish place, Bath.

P. 6th Dec., 1849. Ormerod, George, D.C.L., F.R.S., F.S.A., F.G.S., Sedbury park, Chepstow.

6th Feb., 1851. Osborne, John James, Macclesfield.

3rd Jan., 1850. *Overend, James, 55, Hope street.

3rd Dec., 1857. Oxley, Frederick, 31, John street, Bedford row, London, W.C.

P

23rd Nov., 1858. *Paris, Thomas Jeremiah, 68, Lord street.

3rd Jan., 1850. *Parker, Charles Stewart, Bank chambers, Cook street.
18th Dec., 1856. Parker, Robert Townley, Cuerdon hall, Preston.
7th March, 1850. *Patten, John Wilson*, M.P., Bank hall, Warrington.
2nd Nov., 1854. Patterson, Andrew, Principal of the Deaf and Dumb Institution, Manchester.
9th Oct., 1854. *Peacock, John, 2, Chapel street.
6th Dec., 1849. Pearce, George Massie, Hackin's hey, and Ormskirk.
11th Dec., 1856. *Pedder, Henry Newsham*, 9, Queen's gate, Prince Albert road, South Kensington, London, S.
23rd Nov., 1848. Pedder, Richard, Winckley square, Preston.
8th Dec., 1851. Perrin, Joseph, 63, Wellington road North, Stockport.
21st March, 1861. Petty, Thomas Shaw, Preston.
P. 6th Jan., 1849. *Picton, James Allanson, F.S.A., Queen Insurance buildings, Dale street, and Sandyknowe, Wavertree.
3rd May, 1849. Pierpoint, Benjamin, St. Austin's, Warrington.
23rd Nov., 1848. Pilkington, James, M.P., Park place House, Blackburn.
10th Feb., 1853. *Platt, Robert*, Stalybridge.
29th Dec., 1854. Porter, Rev. James, A.M.
12th March, 1857. *Preston, Geo. Theo. Robert, 13, Vernon street, Dale street, and Rock house, West Derby road.
6th Dec., 1849. *Preston, William, 13, Vernon street, and Rock house, West Derby road.

R

23rd Sept., 1854. *Rathbone, William, 24, Water street, and Greenbank, Wavertree.
15th March, 1849. Rawlinson, Robert, C.E., F.G.S., Sanitary Commissioner, Local Government Act Office, 8, Richmond terrace, Whitehall, and Lancaster lodge, Boltons, West Brompton, London, S.W.
13th Sept., 1854. *Raynes, James Trevelyan, 37, Oldhall street, and Rock park, Rock Ferry.
5th Dec., 1861. *Read, Joseph, 17, Upper Huskisson street.
23rd Nov., 1848. *Reay, James, Guardian Office, Commerce court, Lord street.
23rd Nov., 1848 *Reay, Thomas, 213, Upper Parliament street.
29th Dec., 1854. Rees, William, Old Trafford, Manchester.
14th Dec., 1848. *Robin, John, Chapel walks, South Castle street, and Grove hill, West Kirby, Birkenhead.
20th Dec., 1855. Robin, Rev. P.R., A.M., Woodchurch, Birkenhead.
23rd Nov., 1848. *Robinson, Chas. Backhouse, 12, Myrtle street, and Matilda grove, Aigburth.
3rd Jan., 1850. *Ronald, Robert Wilson, 19, Dale Street.
15th April, 1858. Rooke, Rev. W. J. E., Tunstal Vicarage, Kirkby Lonsdale.
15th April, 1858. Rowlinson, W., Windermere.
25th Sept., 1854. Rylands, Peter, Bewsey house, Warrington.
P. 13th Dec., 1854. Rylands, Thomas Glazebrook, F.L.S., Warrington.

S

3rd Jan., 1861. Samuelson, Edward, Huyton.

6th Dec., 1855. *Sandbach, W. R., Bank buildings, Cook street, and the Cottage, Aigburth.
P. 7th Sept., 1851. *Sansom, Thomas, F.B.S.E., 18, Breckfield road South, Everton.
19th March, 1863. Satterthwaite, Edward, Lancaster.
H.S. Lan., 1862. Saunders, W. A. F., Wennington hall, Lancaster.
23rd Nov., 1848. *Schofield, Henry D., M.D., 14, Hamilton square, Birkenhead.
8th Jan., 1852. Sharp, John, The Hermitage, Lancaster.
2nd June, 1853. *Sharp, William*, 102, Piccadilly, London.
23rd Nov., 1848. Sharpe, Edmund, A.M., Cwm Alyn, Llanrwst, North Wales.
1st Dec., 1855. *Shawe, J. R., Arrowe hall, Birkenhead.
7th Feb., 1850. *Sherlock, Cornelius, 22, King street.
11th Feb., 1858. *Shute, Arthur, 1, Rumford place.
23rd Nov., 1848. *Simpson, Rev, Samuel*, A.M., St. Thomas's Parsonage, Douglas, Isle of Man.
23rd Nov., 1848. Skaife, Thomas, 32, Sussex place, Regent's park, London.
P. 16th April, 1863. *Smith, H. Ecroyd, Aldboro' house, Church street, Egremont, Birkenhead.
2nd May, 1850. **Smith, James*, Seaforth.
16th Sept, 1854. Smith, John, Langley, near Macclesfield.
6th Jan., 1853. *Smith, William Penn, 26, Hanover street.
23rd Nov., 1848. *Snowball, J. G., 10, Castle street, and 11, Upper Canning street.
4th Dec., 1862. Somerville, Thomas, LL.D., Hawthorn hall, Wilmslow, Manchester.
19th March, 1863. *Squarey, Andrew Tucker, Apsley villas, Lower Bebington.
2nd Nov., 1854. Stainer, William, Old Trafford, Manchester.
3rd Jan., 1856. *Staniforth, Rev. Thomas*, Storrs, Windermere.
6th March, 1862. *Stanley, Right Hon. the Lord*, Knowsley hall, Lancashire, and 23, Saint James's square, London, S.W.
5th Feb., 1863. Steele, Alexander, Ph.Dr., Bay View house, The Crescent, Douglas, Isle of Man.
13th Dec., 1855. *Steiner, F.*, Hyndburn, Accrington.
30th Dec., 1854. *Stewart, James Gordon, Woodlands, Clifton park, Birkenhead.
5th June, 1850. *Stock, John.
6th Nov., 1862. *Stone, George, 57, Ranelagh street, and 51, Prospect vale, Fairfield.
6th March, 1862. *Stonehouse, James, 25, Phythian street.
23rd Nov., 1848. *Sutton, Hugh Gaskell.
4th March, 1852. *Sykes, James, Colonial buildings, 34, Dale street, and Breckhouse, Poulton-le-fylde.

T

18th Feb., 1858. *Thompson, Henry, 153, Upper Parliament street, and 11, North John street.
P. 8th Dec., 1851. Thornber, Rev. William, B.A.. Blackpool.
13th Sept., 1854. *Thornely, Samuel, 31, Edge Lane.

8th Dec., 1851. *Tinne, John A., F.R.G.S., Bank buildings, and Briarley, Aigburth.
Mayor Liv. 1854-55. *Tobin, James Aspinall, 57, South John street.
14th Dec., 1848. Tobin, Sir Thomas, F.S.A., Ballincollig, Cork.
8th Jan., 1852. *Torr, John, 15, Exchange buildings, and Eastham.
H.S. Lanc. 1857. Towneley, Charles, Towneley, Burnley.
P. 2nd April, 1857. *Towson, John Thomas, F.R.G.S., 47, Upper Parliament street, and Sailors' Home.
14th April, 1853. *Turner, Charles, M.P., 4, Lancelot's hey, and Dingle head.
27th Sept., 1854. *Turner, John Hayward, 23, Abercromby square.
6th Dec., 1849. Turner, Edward, High street, Newcastle, Staffordshire.
16th Dec., 1858. *Tuton, E.S., 48, Lime street.

U

8th March, 1854. *Underwood, Rev. Charles W., A.M., Vice-Principal, Collegiate Institution.

V

23rd Nov., 1848. **Varty*, *Thomas*, Walpole villa, Fairfield.
14th April, 1853. *Vose, James, M.D., 5, Gambier terrace, Hope street.

W

Myr.C. 1838-39, 48-49. *Walker*, *Sir Edward Samuel*, Berry hill, Mansfield, Notts.
11th Dec., 1856. Walmsley, Thomas, Preston.
6th March, 1851. Warburton, Rowland Eyles Egerton, Arley hall, Cheshire.
21st May, 1857. Ward, John Angus, Hooton Lodge, Chester.
10th Dec., 1857. Wardell, William, Abbotsfield, Chester.
P. 5th Dec., 1861. *Waterhouse, Nicholas, Rake Lane.
6th June, 1850. *Waterhouse, Sebastian.
26th Sept., 1854. *Watling, J. W. H.
5th Feb., 1857. *Watt*, *Richard*, Speke hall.
17th Dec., 1857. Watts, Sir James, Manchester.
2nd May, 1850. *Way*, *Albert*, A.M., F.S.A., Wonham manor, Reigate, Surrey.
1st Feb., 1849. *Webster, George, 6, York buildings, Dale street, and Mosley hill, Aigburth.
P. 3rd Jan., 1856. *Welton*, *Thomas A.*, F.S.S., 10, Percy circus, Pentonville, London.
6th March, 1862. Wensleydale, Rt. Hon. the Lord, Ampthill park, Ampthill.
6th Nov., 1862. *Whatham, William, 7, North John street, and Botanic view, 133, Smithdown lane.
6th Dec., 1860. White, Charles, M.R.C.S.
2nd June, 1853. *Whitley, George, 5, Clayton square, and Bromborough.
9th Oct., 1854. Whitley, Rev. John, A.M., Newton rectory, Warrington.
6th June, 1850. Whitley, Rev. William, B.A., Catsclough, Winsford, Cheshire.

P.	30th Nov., 0854.	Wilkinson, Thomas Turner, F.R.A.S., Corr. Mem. Lit. and Phil. Soc. Manch., Burnley.
	8th Jan., 0852.	*Willoughby, Edw. G., Marine Cottage, Tranmere.
	1st Jan., 0863.	*Williams, Bell, North John street, and 67, Grove street.
	6th Dec., 0855.	Wilson, G., F.R.S., Belmont, Vauxhall, London.
	14th Feb., 0861.	Wilson, J. M., Hardshaw street, St. Helens.
	23rd Nov., 0848.	Wood, Venerable Isaac, A.M., Archdeacon of Chester, Newton, near Middlewich.
	23rd Nov., 0848.	Wood, Isaac Moreton, A.M., Newton, near Middlewich.
	7th May, 0851.	**Woodhouse, John George*, 117, Henry street.
	30th Dec., 0854.	Worthy, George Smith, Bristol.

HONORARY MEMBERS.

	6th Feb., 0851.	Akerman, John Yonge, Hon. M.R.S.L.; F.S.A. Newcastle; F.R.S. of Northern Antiquities; Corr. Mem. SS. Antiq. Scot., France, Russia, Switzerland, Rome; Hon. Mem. Roy. Acad., Stockholm; Somerset House, London.
	27th Sept., 0854.	Babington Charles Cardale, A.M., F.R.S., F.S.A., F.L.S., Professor of Botany, Cambridge.
	6th Feb., 0851.	Blaauw, William Henry, A.M., F.S.A., Beechland, Uckfield.
	6th Feb., 1151.	Boileau, Sir John P., Bart., F.R.S., F.S.A., Ketteringham hall, Wyndham, Norfolk, and 20, Upper Brook street, Grosvenor square, London.
	27th Sept., 1854.	Brewster, Sir David, K.H., D.C.L., LL.D., F.R.SS.L., and E., Hon. M.R.I.A., one of the Eight Foreign Associates of the Academy of Sciences in the Imperial Institute of France and Hon. or Corr. Member of the Academies of Berlin, St. Petersburg, Vienna, Munich, Göttingen, Turin and Modena, and Principal of the University of Edinburgh; College, Edinburgh and Allerly, Roxburghshire.
	1st Nov., 1860.	Brown, James, New York, U.S.A.
	6th Feb., 1851.	Charlton, Edward, M.D., F.S.A. Newc., 7, Eldon square, Newcastle-upon-Tyne.
P.	1st Feb., 1855.	Clarke, Joseph, F.S.A., Saffron Walden, Essex.
	19th May, 1859.	Cochet, M. L'Abbe, Inspector of Antiquities and Monuments in Normandy, Dieppe.
	8th Jan., 1852.	De Perthes, J. Boucher de Crevecœur, Chevalier des ordres de Malte et de la Légion d'honneur, membre de diverses Sociétés Savantes, Abbeville.
	6th Feb., 1851.	Duncan, Philip B., D.C.L., Oxford.
	27th Sept., 1854.	Gray, John Edward, Ph.D., F.R.S., F.L.S., V.P.Z.S., Pres. Entom. Soc., &c., British Museum, London.
P.	27th Sept., 1854.	Latham, R. Gordon, M.D., F.R.S., Greenford, Middlesex.

	9th Dec., 1852.	MacAdam, Robert, 18, College square East, Belfast.
	27th Sept., 1854.	Murchison, Sir Roderick Impey, G.C.St.S., A.M., D.C.L., F.R.S., V.P.L.S., F.G.S., V.P.R. Georgr. S., Hon. M.R.I.A., Director-General of the Geological Survey of Great Britain and Ireland; Trust. Brit. Mus.; Hon. Mem. Acadd. St. Petersburgh, Berlin, Copenhagen; Corr. Mem. Inst. France &c., 16, Belgrave square, London.
	27th Sept., 1854.	Owen, Richard, M.D., LL.D., F.R.S., F.L.S., F.G.S., British Museum, London.
P.	7th May, 1851.	Pidgeon, Henry Clarke, 10, St. Leonard's terrace, Maida hill, West, London.
	27th Sept., 1854.	Phillips, John, M.A., LL.D., F.R.S., F.G.S., Professor of Geology, and Keeper of the University Museum, Oxford; Hon. Mem. Imp. Acad., Moscow; Société Vaudoise &c., Oxford.
	27th Sept., 1854.	Rosse, The Earl of, K.P., D.C.L., F.R.S., F.S.A., F.R.A.S., F.G.S., Birr Castle, Parsonstown, Ireland.
	27th Sept., 1854.	Sabine, Major General Edward, R.A., D.C.L. LL.D., Pres. R.S., F.R.A.S., 13, Ashley place, London, S.W., and Woolwich.
	27th Sept., 1854.	Sedgwick, Rev. Adam, A.M., F.R.S., F.G.S., F.R.A.S., Hon. M.R.I.A., Woodwardian Professor, Trinity College, Cambridge.
P.	6th Feb., 1851.	Smith, Charles Roach, F.S.A., Member of the Roy. Soc. North. Antiq. Copenhagen, Hon. Mem. SS. Antiq., France, Normandy, Scotland, Spain, Newcastle, the Morinie, Abbeville, Picardy, Wiesbaden, Luxemburg, Treves, Touraine, &c., Temple place, Strood, Kent.
	27th Sept., 1854.	Whewell, Rev. William, D.D., F.R.S., F.G.S., F.R.A.S., Hon. M.R.I.A., Corr. Mem. of the Institute of France, Master of Trinity College, Cambridge.
	6th Feb., 1851.	Willis, Rev. Robert, A.M., F.R.S., Jacksonian Professor, Cambridge, and 23, York terrace, Regent's park, London.
P.	27th Sept. 1854.	Wright, Thomas, A.M., F.S.A., Hon. M.R.S.L., Member of the Institute of France; of the Roy. Soc. North. Antiqs. Copenhagen; Hon. Mem. of the Soc. of Antiquaries of France; Corresp. Mem. Soc. Antiq. Normandy; of Soc. Antiqs. Scotland, &c., 14, Sydney street, Brompton, London.

Fig. I. Colonel Wilson-Patten's Spanish Plough.

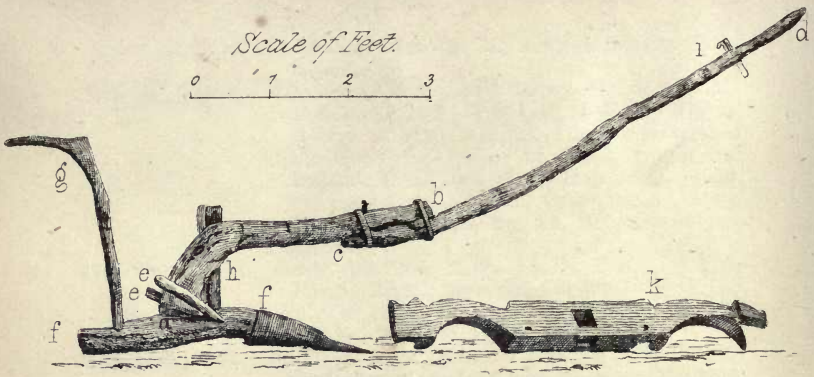


Fig. II Dr. Martyn's Italian Plough.

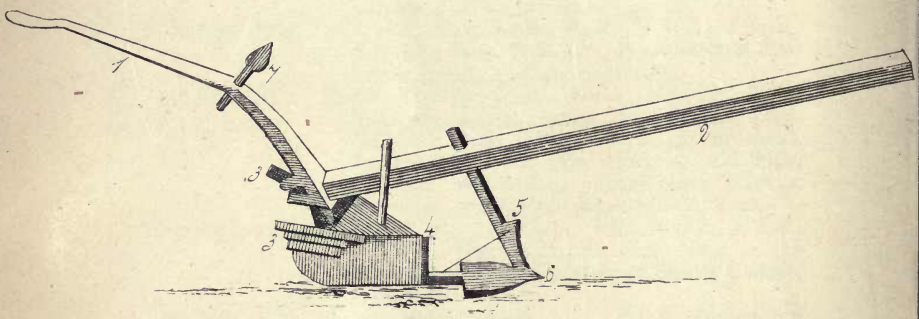
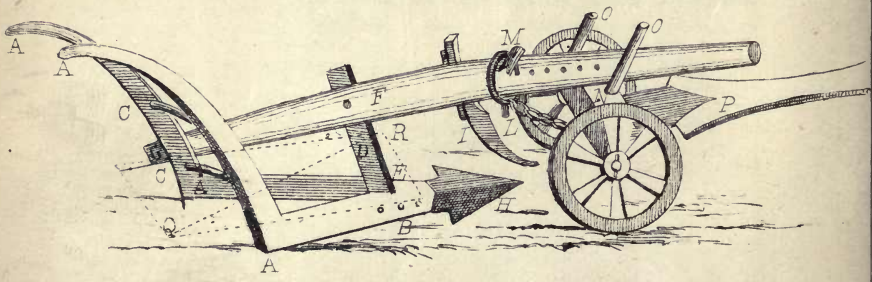


Fig. III Sir Daniel Molyneux's Mantuan Plough.



TRANSACTIONS.

ON VIRGIL'S PLOUGH,

AS ILLUSTRATED BY A RUDE IMPLEMENT IN MODERN USE IN SPAIN.

By John Fitchett Marsh.

[The following is the substance of some *viva voce* observations, made in exhibiting the Plough at a meeting of the Society, on the 4th December, 1862, when Mr. Marsh was requested to put them into the form of a paper.]

The curiously rude plough here exhibited, and which forms Fig. 1 in our page of illustrations, was seen by Colonel Wilson-Patten in actual use in the South of Spain, while he was in command of the 3rd Regiment of Lancashire Militia, in garrison at Gibraltar, during the Crimean War. It was one of fifteen ploughs of similar construction at work on one of the largest farms in the district. Rightly regarding it as a curiosity—knowing that words would fail to give his friends at home an adequate idea of the rudeness of the implements in use by Spanish farmers—and probably desirous of pointing a moral as to the means by which England has attained her present agricultural position, he purchased the plough, and had his prize conveyed on horseback to the fortress of Gibraltar. He exhibited it at the Annual Meeting of the Manchester and Liverpool Agricultural Society, held at Warrington in 1857,

jocularly asserting his claim to the prize (if there had been one) for the worst agricultural implement there exhibited; and afterwards presented it to the Warrington Museum and Library, whence it is brought for the inspection of the Historic Society on the present occasion.

The mode of use is apparent from examination of the plough. The pole is suspended by straps from a hole in the centre of the heavy yoke, borne by two oxen. The yoke presses against a wooden pin (marked *i* on our sketch), which, being placed in one or other of four mortice-shaped holes in the pole, practically lengthens or shortens it, so as to increase or diminish the angle made with the ground by the share, and the consequent depth of the furrow. The pole forms a continuation of what we may describe, for want of a technical term for any corresponding part in the modern English implement, as the Trunk or Body of the plough, and is firmly spliced to it with two stout hoops of iron, tightened with wedges. Two holes in the yoke probably serve for the passage through it of a cord to be used as reins.

When I first saw the implement in the Agricultural show yard, it occurred to me that a more careful study of it might throw light on the description of a Roman plough, contained in the well known passage in Virgil's Georgics. Its appearance indicates that it has undergone little improvement since the time of Virgil; and of all the nations of Europe, probably none has retained in so great a degree as Spain the manners, dress, language, and implements of ancient Rome; of which I will not stop to point out examples.* My conjecture was more than realized by subsequent examination.

* An illustration appropriate to our subject is mentioned by Colonel Wilson-Patten, who, at the same farm where the plough was purchased, saw the process of threshing corn by trampling it under horses' hoofs. The treading out of the corn by oxen is a process of which we have very early record. The use of horses for the purpose is not so familiar; but it is alluded to by Virgil, who, in mentioning the practice of reducing the condition of mares intended for breeding, (Geor. iii., 132), says:—

The subject was not new to me; for the passage had been impressed on my memory by the fact that it was given me at school as an exercise, in which I was required to furnish from it an intelligible account of the construction and details of Virgil's Plough. Whether my respected master really expected me to make anything of it—whether it was a practical joke—or whether (as I have since thought probable) it was a *bona fide* experiment to ascertain how far Virgil's description was calculated to convey any definite ideas to a mind of, I think I may say, fair schoolboy intelligence, I never knew. The result was a hopeless failure. But better late than never; and now, after a lapse of nearly thirty years, I present before another audience, as critical—and less formidable only because I am better prepared to meet it—my long delayed exercise on VIRGIL'S PLOUGH.

The passage commences at l. 169 of the 1st Georgic :—

" Continuo in sylvis magnâ vi flexa domatur
" In BURIM, et curvi formam accipit ulmus aratri :
" Huic a stirpe pedes TEMO protentus in octo :
" Binæ AURES, *duplici* aptantur DENTALIA DORSO.
" Cæditur et tilia ante JUGO levis, altaque fagus
" STIVÆ, quæ cursus a tergo torqueat imo."

I have adopted some emendations in the last line, for reasons which I will shortly notice; but let me first give a translation, as literal as may be, and leaving the technical terms untranslated for the present, so as not to prejudge the questions as to their respective meanings. The passage will then read thus :—

" From the first, while in the woods, an elm, bent with

" Sæpe etiam cursu quatiunt, et sole fatigant,
" Cum graviter tunsis gemit area frugibus, et cum
" Surgentem ad Zephyrum paleæ jactantur inanes."

Pliny also (xviii., 30), says :—" Messis ipsa alibi tribulis in areâ, alibi equarum " gressibus exteritur, alibi perticis flagellatur;" and Columella (ii., 21), says :— " Si competit ut areâ teratur frumentum, nihil dubium est quin equis melius " quam bubus ea res conficiatur."

"great force, is subdued into the '*Buris*,' and receives the "form of the curved plough. Extending from this to a "length of eight feet from the base [root] is the '*Temo*.' A "pair of '*Aures*' and '*Dentalia*' are fitted to the '*Duplex* "*Dorsum*' [not as some would read it, *with a* 'Duplex Dor-"sum']. The light linden is also cut down beforehand for "the '*Jugum*,' and the tall beech for the '*Stiva*,' which is to "turn the course from the bottom of the hinder part."

The first emendation which I have adopted is the reading of "Altaque fagus Stivæ," instead of "Altaque fagus, "Stivaque;" and my authority is the edition of the Georgics by Dr. Martyn, the Professor of Botany at Cambridge, which first appeared in the year 1741. "The grammatical structure "of this passage," he says, "does not seem very clear. "*Cæditur* is made to agree with *tilia*, *fagus* and *stiva*. We "may say *tilia cæditur* and *fagus cæditur*; but to say at the "same time *stiva cæditur* seems to be absurd; for this makes "the staff a tree, by coupling it with lime and beech. "Besides, *que* and *quæ*, coming close together (*stivaque quæ* "*currus*), offend the ear; and I believe there is not another "instance of their coming thus together anywhere in Virgil." Heyne, in what I suppose we must consider the standard modern edition of Virgil, speaks approvingly of the emendation, though he does not quite sanction the arguments in favor of it; and in fact seems to impute to Dr. Martyn a want of scholarship, in not recognising the poetical figure which would justify the use of *stiva* for the wood of which it was made. But, by way of criticism on the critic, we may observe that the question is whether in this place, and in this collocation of words, Virgil would so have used it—first naming the light linden to be cut down for the *Jugum*; then mentioning the tall beech, without alluding to the purpose to which it was to be applied; and then the *Stiva*, without saying of what it was to be made. These considerations, and the

comparison of the jarring sound and halting sense of the received version with the neat antithesis of the one proposed—the light linden for the *Jugum*, and the tall beech for the *Stiva*—make the correction so obvious to my mind, that I am surprised it has not met with universal acceptance. Moreover the error, if error it be, is easily accounted for. The final letter of "stivae" would be readily mistaken in manuscript for "q," the usual contraction for the final "que." Even in early printed books it was not usual to print the "que" in full, or, if in full, to distinguish between the pronoun and conjunction, both of which were printed "que"; and the Bodleian manuscript has "*stiva que currus.*"

The next emendation is not so obvious. It is the reading of "cursus" for "currus" in the same line. For this, also, the authority is a note in Martyn's Georgics, quoting Mr. B—(*qy.* Benson), who says:—"I do not know whether any "edition justifies the alteration I have made of *currus* to "*cursus.* The reason of my doing it is because *cursus* is "intelligible, and explains the use of the handle or plough-"staff; *cursus torqueat imos*—the handle serves to keep the "plough up, which otherwise would run too deep in the "ground. Mr. Dryden, finding this passage difficult to "explain, has left it quite out of his translation. All that "the commentators have said concerning *currus* in this place "is very perplext." Dr. Martyn adds that "the poet is "thought by some to mean a wheel-plough by the word "*currus*, which is derived from *curro, to run;* and Servius "informs us that in Virgil's country the ploughs run upon "wheels. We have wheel-ploughs in many parts of England." Heyne summarily rejects this emendation, on the ground that "aratrum non currit, nec cursum aratri quisquam facile "dixerit:" but whatever objection to "cursus" arises out of its radical meaning surely applies equally to "currus." It matters little for our purpose which reading is adopted; but

we must not allow the supporters of the usually received reading to argue in a circle, by explaining "currus" from its analogy to a carriage, because of its running on wheels, and then contending, from Virgil's use of the word "currus," that he is speaking of a wheeled plough. If his plough had had wheels, so important a feature would have been far more pointedly alluded to; and while two lines out of six were devoted to the *Buris*, the wheels would not have been left to an inference. Neither does it seem probable, from historical evidence, that the wheeled plough was in use in Virgil's time and country. Pliny, in xviij, 18, of his Natural History, which was written more than a century after the Georgics, after speaking of the broad share, with cutting edges and sharp point, as having been invented not long since in Rhætia, mentions the addition of two small wheels as peculiar to the Gauls.

If the reading of "cursus" be adopted, and in that event only, I would propose, with all the diffidence becoming the suggestion of a conjectural emendation unsupported by authority, the alteration of "imos" to "imo," so as to make the adjective agree with "tergo." If we can suppose the line so corrupt as to require two emendations, we need have little scruple in admitting a third. If my new reading be rejected, we must translate the concluding words of the passage, "to "turn the course, at the bottom, from behind."

Martyn's translation—in which, however, he has not adopted the emendations he recommends in the text—is as follows:—
"In the first place the elm is forcibly bent in the woods into "a plough-tail, and receives the form of the crooked plough.
"To the end of this are joined a beam, eight feet in length,
"two earth-boards and share-beams, with a double back.
"The light lime tree also is cut down beforehand for the yoke,
"and the tall beech, and the staff, to turn the bottom of the
"carriage behind." To illustrate this description he has a plate (copied in fig. 2 of our illustrations), which he thus

introduces:—"I have here inserted the figure of a modern "Italian plough, which seems to differ but little from that "which Virgil has described. It seems to have no *Stiva*, "distinct from the *Buris;* and it has a coulter, which Virgil "does not mention: and indeed Pliny, who describes the "coulter, seems to speak as if it was not in all ploughs." In his plate, the various parts of which I have numbered for convenience of reference, he makes 1 the *Buris*, 2 the *Temo*, 3, 3, the *Aures*, 4 the *Dentale*, 5 the *Culter*, and 6 the *Vomer*, the two latter not being mentioned, at least by name, in the passage of Virgil under discussion. According to his own view of the subject (in which I must not be understood as concurring) Dr. Martyn is scarcely correct in saying there is no *Stiva;* as the staff, numbered 7 in our figure, answers, or would assist in answering, Virgil's description of its office.

The same plate in Martyn's Georgics contains a second figure of a plough, copied in our fig. 3, and of which he writes:—"After my notes on this passage were printed, I had "the favour of a letter from Sir Daniel Molyneux, Bart., "dated from Rome, July 27th, 1737, with a drawing and "description of the plough which is now used about Mantua "and Venice. There is a plough used in many parts of "England which differs very little from this; but yet I "believe it will be no small satisfaction to my readers to find "an exact account of the very plough now employed in cul-"tivating the lands in Virgil's own country. The two timbers "marked A are each made of one piece of wood, and are "fastened together with three wooden pins at B. C, C are "two transverse pieces, which serve to hold the handles "together at the back. D is a piece of wood fastened to the "left handle, or *Sinistrella*, at E, and to the beam F. F is "the beam, or *Pertica*, which is fastened to the left handle, at "G. H is the plough-share, into which the *Dentale*, or "share-beam, seems to be inserted. I is the coulter, being

"a piece of iron, square in the body, which is fixed in the "beam and bending in the lower part, and having an edge to "cut the weeds. L is an iron chain, fastened at one end to "the plough-pillow, or *Mesolo*, N, and at the other to the "beam, by an iron hammer, M, the handle of which serves "for a pin; and the more forward you place the hammer, the "deeper the share goes into the ground" [an arrangement very similar to that above pointed out in Colonel Wilson-Patten's Spanish plough]. "O, O are two pieces of wood, fastened to "the pillow, which serve to keep the beam in the middle. "P is the pole, or *Timonzella*, to which the oxen are yoked, "and is of no certain length. Q, R (with prickt lines) is a "strong plank, which is fastened to D and to the left handle. "This, being placed sloping, serves to turn up the earth and "make the furrow wider. This part, therefore, is the earth-"board, or *Auris*, of Virgil, of which he says there should be "two; but in this plough there seems to be but one. I do "not question but that the Mantuan plough was in Virgil's "time more simple than that here described; but let us "compare a little the poet's description with that here before "us. Let the left handle A, A, be supposed to be the *Buris*, "the right handle A, A, to be the *Stiva*, and A E, A B, to "be the two *Dentalia*. Here then we see the crooked *Buris*, "to form which an elm was bent as it grew. Near the bottom "of this, *huic a stirpe*, we see the pole is inserted, which "probably was continued to the length of eight feet, and had "the oxen yoked to it without the intervention of the *Timon-"zella*. The two handles may very well be supposed to be "meant by the double back, to which the two share-beams are "joined. Upon this supposition we must make some altera-"tion in interpreting the two verses, '*Huic a stirpe*,' &c. "'From the bottom of this a beam is protended, eight feet in "'length, and two earth-boards and share-beams are fitted to "'the double back.' The wheels were probably fixed imme-

"diately to the beam, and shew the propriety of the word "*currus*, as is already observed in the note on ver. 174."

Both one and the other of the two descriptions just given are to my apprehension extremely unsatisfactory; but I have thought it fair to quote them, and to copy the plates by which they are illustrated, for the sake of comparison with the views I am going to express. I would for the same reason have given extracts from the article "ARATRUM," in Dr. Smith's Dictionary of Greek and Roman Antiquities; but it is unnecessary to quote at length a work which is in every one's hands, and to which we naturally turn as the latest and best authority. Suffice it to say, that the writer of that article, Mr. Yates, like his predecessors, treats the *Buris* as meaning the *Plough-tail*, the upper end of which being held by the ploughman, the lower part, below its junction with the *Pole* was used to hold the *Share-beam*, to which three continuous and most essential parts Virgil adds the *Earth-boards* and the *Handle*.*

The interpretation of the word BURIS has presented the principal difficulty. It occurs nowhere else in Latin literature; and the word *Bura*, in a single passage in Varro (i. 19), is the only authority for anything like it. Servius, whose

---

* Since my paper was ready for the press, I have had my attention called to an extensive series of illustrations of ancient ploughs in Loudon's Encyclopædia of Agriculture. He mentions the Abbé Rozier, who wrote in 1796, as identifying the Roman plough with that in use in the South of France, of which an illustration is given, strongly resembling our Spanish specimen, but without the projections *e*, *e*, and having the handle composed of two pieces; but no comparison of details is given. On the authority of Dickson's Husbandry of the Ancients, 2 vols. 8vo., Edin., 1778, he considers the nearest approach to Virgil's plough to be one in use in Valentia, of which also he gives an illustration. It bears some little resemblance to the implement before us, though differing considerably both in construction and details; but the attempt to connect its various parts with Virgil's description is still more unsatisfactory than those quoted in the text. Another illustration of a plough used in Castile and other provinces of Spain is worth comparing; but it has rather the appearance of a conventional representation, copied from some piece of sculpture, than of a drawing from an actual object. All of these have the parts which I have called the Trunk and the Pole distinct from each other. They are either spliced together, as in our specimen, with iron hoops, or with cords.

commentary is contained in the Variorum Edition of 1529, now on the table, and has furnished materials for a large proportion of the notes of subsequent editors, derives it from *βοὸς οὐρὰ*, which has been treated as justifying and suggesting the translation of *Plough-tail;* but I would submit that a plough-tail and a cow-tail are very different things; and whatever inference is to be drawn from this derivation is in favor of the *Buris* representing that portion which, in our Spanish plough, occupies the same position in relation to the body of the implement as the tail does in relation to the animal, namely the lowest and hindmost part of the *Dorsum,* bending downwards like a tail. In short, I interpret it as meaning that part of the plough which, in our illustration, is marked *a, b.** Possibly it might derive its name from its being that part nearest to the tails of the oxen in ploughing; or may we not, abandoning *βοὸς οὐρὰ* altogether, derive it conjecturally from *βοῦς* and *ἀρόω*, or rather from their roots, which are common to the Greek and Latin languages? The editor of the Medicean Codex (now on the table) prints "*Imburim.*" Whether anything turns on this—whether it is possible that Virgil may have coined an adverb from the word *Bura*—I leave to more skilled philologists to decide. For our present purpose, I am content to accept *Buris* as a noun, and to translate it by some English equivalent which shall be consistent with the description given of it by Virgil. It is contrary to the natural course of thought that a person describing a complex implement should begin with a subsidiary portion of it, such as the handle; and it is most unlikely that

* Vossius, in his Etymologicon Ling. Lat., fo., Amst, 1662, after quoting this passage of Virgil, s. v. *Bura,* writes:—"Satis hinc liquet esse imam temonis "partem, cui aptatur dentale, uti dentali vomer prefigitur" (which exactly corresponds with the views I have expressed, though I had not consulted the Etymologicon until I was preparing my manuscript for the printer); and after giving various derivations, some of which it must be confessed are rather wild, he adds:—"Onomasticon vetus *Buram* interpretatur *ἐχέτλη*. Sed in Glossis "Cyrilli *ἐχέτλη* vertitur *Stiva* quæ a Bura differt. Etiam in Glossis legas *Buris,* "*ῥυμός;* atqui *ῥυμός, Temo:* buris autem non temo, sed ima ejus pars."

Virgil would have occupied just one-third of the passage in the description, or have described such careful and laborious preparation of it, if after all it had been little more than a stake, such as, but for the dignity of poetry, he might have directed his Agricola to cut out of the nearest hedge. Such at least is the character of the handle, or plough-tail, in the specimen before us; but I must not beg the question, by assuming, at this stage of the enquiry, its identity with Virgil's plough. According to the poet's express words, the *Buris* was something, the curvature of which formed the characteristic feature of the plough itself—"curvi formam "accipit ulmus aratri;" and the very passage in Servius, from which the commentators have extracted his etymology of *Bura* or *Buris*, renders "*In burim*" by "In curvaturam; "nam buris est curvamentum aratri, dictum quasi *βοὸς οὐρὰ* "quod sit in similitudinem caudæ bovis." I propose then to translate it by some such term as I have adopted in describing Colonel Wilson-Patten's plough—the TRUNK or BODY. Its weight would no doubt vary according to the strength or lightness of the soil on which it was to be used. In Virgil's plough it was, I should think, much more massive than in the specimen before us, unless large allowance is to be made for poetical diction in such phrases as "inflexi grave robur "aratri," &c.

That TEMO is the POLE admits of no question. According to the translation I have given, the length of eight feet (the Roman foot differing very little from our own) is to be measured from the point of the *Temo* to the *stirps*, or foot, of the *Buris*.

The BINÆ AURES, commentators are agreed in translating *two earth boards;* for a passage in Palladius (i. 43), describing their use, which was to enlarge the furrow already made by the *vomer*, and pointing out the distinction between *aratra aurita* and *simplicia*, had left no room for doubt. But why

should earth-boards be called *Aures?* If, in English, they had been called *Ears*, we should perhaps have been told that the word presented no difficulty—that "to ear" (A.S. erian), is a good old English word for "to plough"—that the *earth* is that which is eared—and that the *ears*, the part being taken for the whole, are the instrument with which it is eared, or ploughed. But we should have been following a false scent; and I only make this passing allusion to the word as an illustration of the uncertainty of conjectural etymology as a guide, unless due attention be paid to the history of words; and to observe the coincidence between the Latin word *Aures* and the old English verb. If it be again asked why were the earth-boards called *Aures?* our Spanish plough, "arrectis "auribus adstans," shall answer the question; for no one, after looking at the projections marked *e*, *e* in our figure, will doubt the propriety of the term, or hesitate to give to it the literal translation of A PAIR OF EARS.

The DENTALIA have sadly puzzled commentators. Dr. Martyn supposes the word to mean a sharebeam with two legs, one of which was fastened to the bottom of the tail, and the other nailed to the beam; and that these two legs were the *Duplex Dorsum;* but he admits that it is not very clear why the *Dentalia* are said to have a double back. A similar explanation is given in the article in Smith's Dictionary of Antiquities, where it is stated as probable that "as the "*Dentalia*, that is the two share-beams, which Virgil supposes, "were in the form of the Greek letter A, which he describes "by *duplici dorso*, the *Buris* was fastened to the left share-"beam, and the *Stiva* to the right." The explanation I would suggest is that the plural form *Dentalia* (differing from *Dentale*, which we should have translated share-beam, from *Dens*, which would have indicated a single tooth, and from *Dentes*, which would have implied two or more) was intended to comprise the compound apparatus for cutting the furrow,

including what we should now call the share and share-beam, and perhaps might even include the coulter, if Virgil's plough was intended to have one; and this would account for his making no special mention of the *vomer*, which was an undoubtedly essential feature. In a similar manner we speak of "cart-gears," as a term comprising various objects, none of which could properly be spoken of in the singular as "a gear;" and perhaps *tooth-* or *share-gear* would not be an inappropriate rendering of *Dentalia*, according to my idea of it. I have however translated it SHARE-APPARATUS, by which we must understand that part of our Spanish plough marked *f, f*, in the figure, including the *Vomer*, or iron beak, with which it terminates.

The DORSUM would have presented no difficulty but for the epithet *duplex*. In order to furnish an explanation, attempts have been made to construe the words as having relation to the *Dentalia*, which it is stated are fitted "with a double "back." I have just been instancing one of the modes in which a way was thus sought out of the difficulty; and another is to interpret *duplex dorsum* as that "cujus utrumque "eminet latus;" and it has even been attempted to explain it away as meaning only "broad," for which authorities are found, or supposed to be found, in Virgil, Horace and Lucretius. Dr. Smith, in his excellent Latin-English Dictionary, quotes as his authority for what (to speak respectfully) is at least a solitary meaning of the word *Dorsum*, the phrase *Duplex Dorsum Dentalium*, with a reference to this passage, and the translation of "projecting irons." I submit that Virgil neither wrote nor meant *Dorsum dentalium*, but referred to the *Dorsum aratri;* and I understand by the *Dorsum* the entire length from *a* to *d* in the figure of the Spanish plough, aptly termed *dorsum*, from analogy in position to the spinal column of a quadruped, and styled *duplex* because it is compounded of the *Buris* and *Temo* spliced together as in

the specimen before us, and to which the *Aures* and *Dentalia* are fitted. If it be objected that the former are not fitted directly to the *Dorsum*, but only through the medium of the share-beam, we may read *Aures* as agreeing with "sunt" understood, instead of with "aptantur." It is quite possible that in Virgil's time the *Buris*, or *Trunk*, and the beam *f*, which I have treated as part of the *Dentalia*, may have been in one piece, thus furnishing an additional reason for the bending of the growing tree, which would assume a more artificial form than in the object before us—dispensing with the stay shown at *h* in the figure, and which is not mentioned in Virgil, though used by the Greeks and Romans, under the names of σπάθη and *fulcrum* (see Smith's Dictionary of Antiquities)—and rendering more appropriate the epithet of *uncus*, elsewhere applied by Virgil to the plough. If this were so, I should include the part in question in the *Dorsum*.

The JUGUM, or YOKE, needs no explanation. If, in Virgil's time, it was of similar size and proportions to the specimen here exhibited, the lightness by which he characterises the linden would be no small recommendation, both to the proprietor and to the

"Fessos vomerem inversum boves
"Collo trahentes languido,"

observed by Horace. His description is quoted by the writer of the article in Smith's Dictionary of Antiquities, as an authority for the statement that "when the ploughman had "finished his day's labour, he turned the instrument upside "down; and the oxen went home, dragging its tail and "handle over the surface of the ground." This would have been a very unthrifty practice, if the shape of the implement had rendered it possible; and I should rather understand that it was turned both upside down and back to front, so as to suspend it from the *Jugum* by the *Dentale* (see plate inverted), by which means the oxen would carry the heavy part of the plough, while the light end of the *Temo* might

trail on the ground without injury. This arrangement would much enhance the force and beauty of Horace's picture; and is more definitely alluded to in a similar sunset picture by Virgil (Ec. ij, 66) :—

"Adspice, aratra *jugo* referunt *suspensa* juvenci,
"Et sol crescentes decedens duplicat umbras."

If I have succeeded in dispelling the notion of the *Buris* being a plough-tail, we are left at liberty to assign the STIVA to the HANDLE, or tail, marked *g* in the figure. We speak of the plough-tail, and I believe (by way of contradistinction) of the plough-head also ; but may not the former term have been originally, not plough's-tail, but plough-stail, or stele (A. S. stela) ?

Our translation then—avoiding rendering the Latin words by the technical terms describing the parts of an English plough, with which they have little analogy, and less resemblance—will read :—

"From the first, while in the woods, an elm, bent with great "force is subdued into the TRUNK, *a b*, and receives the form "of the curved plough. Extending from this for a length of "eight feet from the base, *a*, is the POLE, *c d*. A PAIR OF "EARS, *e*, *e*, and the SHARE APPARATUS, *f*, *f*, are fitted to the "SPLICED BACK, *a d*. The light linden is also cut down "beforehand for the YOKE, *k*, and the tall beech for the "HANDLE, *g*, which is to turn the course from the bottom of "the hinder part."

I submit that this explanation furnishes an intelligible meaning for every technical term used in the passage—that every word of Virgil's description which has hitherto presented a difficulty has not only been explained, but illustrated by some part of Colonel Wilson-Patten's, or, as we may now call it, the Warrington Museum Plough; and that this rude implement, with very slight allowance for the change of fashion in 1900 years, represents substantially, and in detail, the plough which Virgil intended to describe.

When the foregoing observations were made, and even when they were subsequently committed to paper, I had not thought it necessary to examine the passage in Hesiod, in which the several parts of a plough are mentioned—my object not being to write a general dissertation on ancient ploughs, but to identify the Spanish implement with that described in the first Georgic. I have since been led, in consequence of the passage being cited in Martyn's Notes, to look into it more carefully, and am glad to find that our plough throws light on Hesiod's description, as well as Virgil's. In the Ἔργα καὶ Ἡμέραι, after reminding the husbandman at the proper season to cut timber for various specified purposes, the Ascræan Tusser proceeds, at l. 425, as printed in the edition of Schrevelius, 8vo., Lug. Bat., 1658:—

"Φέρειν δε γύην, ὅτ' ἂν ἔυρης,
"Ε'ις ὄικον, κατ' ὄρος διζήμενος, ἢ κατ' ἄρουραν,
"Πρίνινον. ὅς γαρ βουσὶν ἀροῦν ὀχυρώτατος ἐστιν,
"Εὖτ' ἂν Αθηναιής δμῶος ἐν ἐλύματι πήξας,
"Γόμφοισιν πελάσας προσαρήρεται ἰστοβοῆϊ.
"Δοιὰ δε θέσθαι ἄροτρα, πονησάμενος κατὰ οἶκον,
"Αὐτογύον, καὶ πηκτόν. ἐπεὶ πολὺ λώϊον ὕυτω.
"Ἐιχ' ἕτερον γ' ἄξαις, ἕτερον γ' ἐπὶ βουσὶ βάλοιο.
"Δάφνης δ' ἢ πτελέης ἀκιώτατοι ἰστοβοῆες,
"Δρυὸς ἔλυμα, πρίνου * γύην."

Which, reserving as before the interpretation of technical terms, I propose to translate as follows:—

"And bring to the house, whenever you find it, seeking it "on hill or plain, an Ilex *γύης*; for this is the strongest for "oxen to plough with, when the servant of the Athenian "goddess, fixing it into an ἔλυμα, joining them with nails, "shall have fitted it to an *ἰστοβοεύς*. But lay by two ploughs, "having prepared them at home—one *with a natural* "*γύης* (*αὐτογύον*), and a *constructed* one (*πηκτόν*)—since this is "much the better plan. If you should break one, you can

* Sic—but prosody requires the reading of *γύην πρίνου*. See Liddell and Scott, s. v. *πρίνος*.

"put the other to the oxen. Laurel or Elm is the most "durable for the ἰστοβοεύς, Oak for the ἔλυμα, Ilex for "the γύης."

Such are the three parts of Hesiod's plough, of which Dr. Martyn says that all interpret the γύης as the *Dentale*, and that it is fastened to the plough-tail, and at the same time nailed to the pole. If this could be established, as the ἰστοβοεύς, from its etymology (ἱστος, *a mast*, and βοῦς) *an ox*), can be no other than the pole, the ἔλυμα would be left to represent the *Stiva*. I was at first inclined to accept this view, according to which the γύης, answering to the Share-beam, *f*, *f*, in our figure of the Spanish plough, is first described, as being the effective part, and (in construction) the basis of the plough; to which were attached, on the one hand, the means of draught, namely the ἰστοβοεύς (corresponding with the *Dorsum*, *a* to *d*, but consisting of one piece instead of being compounded of the *Buris* and *Temo*), and on the other, the means of guiding it, namely, the ἔλυμα or *Stiva*, *g*. In this condition, it would be an ἄροτρον πηκτόν, or constructed plough, which, though considered in Hesiod's time too gimcrack an affair to be trusted, without having a good old fashioned αὐτογύον at hand to supply its place in the event of the more scientific implement breaking down, was certainly more primitive than Virgil's. It would be easy to trace the steps by which both it and the various other known forms derived their origin from the primitive type, namely a young tree, the trunk of which would form the pole; a branch making a somewhat acute angle with it, the Share-beam; and another projecting on the contrary side, the handle. This would form the anchor-shaped plough, of which an illustration is given in Smith's Dictionary of Antiquities, and which, in a more or less conventional form, is common in pictorial illustration. The inconvenient position of the upper branch, forming the handle, would naturally suggest the substitution of an artificial

handle, directed backwards instead of forwards, which gives us at once the Mysian plough, delineated by Sir Charles Fellows, and copied in Smith's Dictionary, as well as the hooked form which was alluded to in discussing the word *Dorsum*, and that of which a specimen, engraved from a brass figure in the Jesuits' College at Rome, is contained in Warton's Virgil, 4 vols. 8vo. London, 1753. The latter is accompanied by an attempt, in a note by Spence which it is not worth while to discuss, to connect its parts with Virgil's description. If, on the other hand, a piece of timber were met with, curved so as to form a handle and share-beam in one piece, it would want only the pole, with which to connect it with the yoke, in order to assume the form described in Hobhouse's "Albania," i, 140, also quoted in Smith's Dictionary, and that shewn in one of the plates to Stanhope's Olympia.

Modern scholarship, however, is not so unanimous as represented by Dr. Martyn in interpreting *γύης* as *Dentale;* and there is no lack of authority for Mr. Yates's conclusion that *γύης* was equivalent to *Buris*, *Bura;* and *ἔλυμα* to *Dens*, *Dentale;* or indeed for any possible or impossible combination of the Greek and Latin terms, the interpretation of which has been influenced by the mistaken notion as to the form and meaning of *Buris*. Etymology does not offer us much assistance. Γύης, which also means a certain superficial measure of land, is generally, but I think unsatisfactorily, derived from *γαῖα*, or *γῆ*. May it not be derived from the same root as *γύαλον*, *a hollow*, the connecting idea being a hollow or furrow, formed by the plough-share in marking the boundaries of lands and cities? The latter use of the plough is so familiar as to have given rise to one of the conjectural etymologies given by Vossius for *Buris*, and alluded to in a note on a previous page, namely, by transposition of letters, from *urbis*. According to either one or other derivation we obtain no suggestion as to its meaning, except that it formed the principal feature of the implement. If *ἔλυμα* or *ἕλυμα* be derived

from ἑλυω, Damm's Lexicon, by Duncan, edited by Rost (4to. Lips. 1831), translates the verb by *curvo, proclino;* and illustrates it from Il. ψ. 393, ῥυμὸς ἐπὶ γαῖαν ἑλύσθη, *Temo in terram provolutus et protrusus est,* which even more accurately describes the position of our *Stiva,* curving downward from the hand towards the ground, than that of a chariot pole thrown to the ground by the breaking of the yoke. If, on the other hand, it be from αἱρέω (root, ἕλω; see Liddell and Scott, s. v. αἱρέω), *to take with the hand,* a handle is again the natural meaning of the word. To notice all the authorities I have consulted would be to exceed any reasonable limit of space. Those who wish to pursue the subject further will find ample information (s. v. Γύης and Ἔλυμα) in that vast storehouse of critical learning—Stephani Thesaurus Græcæ Linguæ—the third edition of which (Paris, 8 vols. fol.) is just on the point of completion. The result of the body of criticism there collected is the somewhat unsatisfactory one, that after rendering γύης *dentale,* it is stated that "locum habet nonnisi "in aratris αὐτογύοις, minime in πηκτοῖς, in quibus γύης est "*buris, dentale* ἔλυμα;" and the authorities as to ἔλυμα are summed up by saying—"unde, intelligitur ἔλυμα dici modo "*dentale* modo *buram,* utrumque non, ut Buttm. Lex. II. "164, opinabatur, quod terram feriat sed quod terram versus "inclinetur"—a conclusion too like that of the young astronomer who thought to avoid committing himself on the knotty question whether the earth revolves round the sun or the sun round the earth, by answering "sometimes one and sometimes "the other."

A classical friend, on whose judgment I have great reliance, suggests an interpretation, which tends to make the opposing theories somewhat less irreconcilable. He would read γύης as equivalent to *Buris,* in the sense in which I have interpreted the Latin word—ἱστοβοεύς to *Temo,*—and ἔλυμα to *Dentale*—thus bringing us round to the translations adopted by Mr. Yates, but with a widely different meaning from that with

which he has used them. According to this reading, the handle is either wholly unmentioned in the passage before us (the word ἐχέτλη being elsewhere used by Hesiod to express it), or it is to be considered as forming (either as an outgrowing branch, or as a prolongation backwards in a curve), a part of the share-beam—approximating in that respect to Hobhouse and Stanhope's forms. I incline to the latter view for the etymological reasons above given. It is possible, then, that the distinction between the ἄροτρον πηκτόν, and αὐτογύον may have been that the one had, and the other had not, the "*duplex* dorsum" of Virgil's plough; and our fig. 1 would serve as an illustration to Hesiod, except that an ἔλυμα in the form just suggested should be substituted for the *Dentale*, *f f*, and the *Stiva*, *g*. This idea receives strong support from a note of the Scholiast on Apollonius, quoted in Stephani Thesaurus, which, in describing the ἄροτρον πηκτόν, says:—"Ἔλυμα δέ ἐστιν ἐν ᾧ ὁ ὖνις ἐντίθεται. Τὸ δέ ἀπὸ τοῦ "ἐλύματος ξύλον ἐπὶ τοὺς βόας τεῖνον γύης καλεῖται, τὸ δέ ἀπὸ "τοῦ γύου ἱστροβοεύς."—"The ἔλυμα is that in which the share "is inserted: the timber extending from the ἔλυμα towards "the oxen is called the γύης; that from the γύης the "ἱστροβοεύς."

I fear I have wandered too far from my original object in discussing the Greek terms; but I cannot resist the temptation to quote an authority on the Latin ones in Pasor's Index to Hesiod, containing a description, which only wanted a drawing of the Warrington Museum Plough as an illustration, to make it the most intelligible account of the Latin names I have anywhere met with. S.v. αὐτογύον he says:—"Est "pars aratri quod vocatur *Dentale*: est lignum cui *Vomer* "includitur. *Vomer* est qui terram scindit et liras ducit: "*Stiva* vero est aratri manica." It is only fair, however, after quoting Pasor as an authority, to add that he translates ἔλυμα *temo*, and ἱστροβοεύς *stiva*, in which I trust I have given ample reason for not agreeing with him.

ON THE LIFE AND WRITINGS OF SCHILLER.

By Hermann Baar, Ph. Dr.

[Read 11th December, 1862.]

There is not a man in the whole history of her literature of whom Germany is prouder than of Schiller the poet. His great popularity is not limited to his native country, but it extends wherever poetry, truth and noble aspirations are valued as a principal means of raising the greatness of man.

Johann Friedrich Schiller was born on the 10th of November, 1759, in Marbach, a little town belonging to the kingdom of Würtemberg.

The romantic scenery of his native country, Suabia, and the impressions which his noble soul received from his tender-hearted mother, were the first influences which kindled in the boy a fire of inspiration for the good and beautiful, which afterwards shone so resplendent from the radiant mind of our great poet. When six years old, the fond and kind Moser, minister of the Suabian village of Lorch, instructed the boy in the Greek and Latin languages. Schiller speaks later with great affection of his master; nay, he gives him an everlasting monument of remembrance in his first drama, "The Robbers," wherein he introduces him as the kind, conciliatory "Pastor "Moser."

At the removal of Schiller's parents to Ludwigsburg, then the residence of the Duke, the growing boy was placed in the grammar-school of the town, where, under the superintendence of the head master, Jahn, he made considerable progress in all the various branches of knowledge, but particularly in Latin. It seems as if, here, the relationship between master

and pupil was not based on affection, for when, after a while, his scholastic superior received another situation, and Schiller, as the best Latin scholar, was chosen to welcome the newly appointed master "Winter" with some friendly words, it is said that he expressed himself in the significant terms, "We pupils "hope that *Winter* may favour us with a delightful *Spring*."

When fifteen years old, in 1774, he entered the "Karls-"Schule," an Institution which, founded by the worthy Duke Charles Eugène, prepared its pupils gratuitously for all the higher professions of life, Theology excepted. Here he devoted himself to the study of Law; but, finding it too dry and uninteresting for the high and imaginative flow of his soul, he very soon relinquished this study to choose, in preference, the profession of his father, viz., Medicine. About this time Lavater, the celebrated physiognomist, visited the school for the purpose of practising his theories upon the pupils. In doing so, the learned man found all the propensities of a villain upon the noble brow of our embryo Poet.

It is said that the pedantic and narrow-minded discipline of the Karls-Schule, based, as it was, upon military regulations, unfavourably impressed itself upon the youth, and not only tended to make him *gauche*, stiff and ungraceful in his external appearance, but also laid an early foundation for that grave and melancholy feeling which, in after life, so often pervaded his soul. We do not believe in these assertions; on the contrary, we think that the firm, exact and military tone of the Institution was quite suited to frame and discipline the poetical digressions of his youthful imagination, and to call forth that manly, independent character which, at a later period, ornamented his life; for the very Karls-Schule, which took under her discipline the genius of a Schiller, nurtured, a few years later, under her training influence the artistic skill of a Dannecker and the scientific talent of a Cuvier. In this Institution Schiller pursued his medical

studies with zeal and perseverance. He wrote a dissertation on the connection between the animal and spiritual nature and, to prevent his mind from being entirely absorbed in his professional duties, he read, in his leisure hours, the works of Shakespeare, Rousseau, Plutarch, Lessing, Goethe and Shubart. The impressions which he drew from these works penetrated to the very core of his lofty spirit and, as the constraint under which he was still kept in his military prison-house became more and more unpleasant and irksome to him, he resorted to the fresh springs of his poetical genius, and poured out all the uneasiness of his heart in his first dramatic work, "The Robbers."

It is said by Macaulay, "No man can be a poet, or even enjoy "poetry, without a certain unsoundness of mind," if anything that gives so much pleasure ought to be called unsoundness.

We do not know whether Macaulay is right in regard to the "fine frenzy" which he ascribes both to the reader and to the poet; but he is undoubtedly right if we apply his words to Schiller's first dramatic attempt, "The Robbers." "The "Robbers," placing before our minds two brothers of opposite characters,—Charles, open, bold, hot-headed and prone to great passion; Francis, sly, cunning and capable of assuming the most perfect form of base and vicious hypocrisy,—is a Tragedy which, notwithstanding the great success it met with, contains in its structure and idea the youthful exaggerations and immature reflections of an inexperienced youth. We can easily imagine that a noble nature like Charles may be led away by slander and intrigue; but we can never suppose that a character like his could take a fancy to form a band of robbers, nor do we believe in his exaggerations when he says "that two men like himself could ruin the whole edifice of "the moral world."

His foe and brother, Francis, is no other than the highest degree of wickedness in the abstract. We specially say *in*

the abstract, as it is scarcely possible that there can exist on earth a *concrete* nature, endowed with all the malicious propensities of a character such as Francis. There are a great many beautiful passages in this tragedy which deserve our attention. We have selected two of them, proceeding from the mouth of Charles, to show the noble thoughts which animated his soul. The one is an exclamation, beginning with the words, "Why should man succeed in what he learns from the ant, and "fail in that which assimilates him to the gods?" The other is a confession of remorse at the life he leads,—"My innocence, "my innocence! See, all are gone forth to sun themselves in "the glad rays of spring! Why must I alone imbibe the pains "of hell from the joys of heaven? All so happy, so united by "the spirit of peace! The whole world one family, and one "Father above all, and I alone banished from the ranks of "the pure! For me, no sweet name of child; for me, no fond "glance of love; for me, no embrace of a beloved friend! I "sink into the grave of destruction, leaning on the feeble reed "of vice, amidst the flowers of a happy world, a howling "Abaddon!"

The publication of "The Robbers" and its first performance in Manheim, where Schiller went to witness its reception on the stage, without having permission from the Duke (his benefactor), in whose service he was appointed military physician, drew upon him the displeasure of his patron, who not only placed him under military arrest for a fortnight, but also prohibited him, in the strictest terms, from ever again appearing before the public with his poetical productions.

Schiller would gladly have submitted to every privation and every punishment, provided that he only obtained permission to diffuse the treasures of his intellect through the world and to link his fame with those who will ever be named, both by contemporaries and posterity, with admiration and reverence. "The god-like gift of genius," which had all the power to make

him happy and through which he was to win the laurel wreath, now became to him the source of torture and martyrdom,— "condemned never to slake his thirst, though ever in sight of "the alluring fountain." Our poet could, therefore, no longer tolerate the heavy weight laid upon the wings of his poetical soul and, as he could find no other outlet by which to escape from a position so distasteful and disagreeable to the sacred calling of his inspired breast, he severed, by a flight to Manheim, the ties which had hitherto bound him to his benefactor, the Duke Charles Eugène.

Here it was, in Manheim, that he first met his most stern and severe teacher, adversity. Lewes, in his Life of Goethe, says, "he (Goethe) never knew adversity. This alone must "have necessarily deprived him of one powerful chord which "vibrates through the life of genius. He never knew the gaunt "companionship of want, whispering its terrible suggestions. "He never felt the necessity to conquer for himself breathing-"room in the world; and thus all the feelings of bitterness, "opposition and defiance, which perplex the struggle of life, "were to him almost unknown and taught him nothing of that "aggressive and practical energy which these feelings develop "in impetuous natures." It was otherwise with Schiller who, in Manheim, disappointed at the unredeemed promises of his influential friend Dalberg, suffered the utmost want and severest trials for the maintenance of his physical life. But, in the midst of this tempest, tossed about upon the troubled sea of need and privation, the skilful mariner directed his tender barque to the lonely village of Oggersheim where, under the mild influence of nature and the warm sympathies of his musical friend Streicher, he composed his second tragedy, "The "Conspiracy of Fiesco in Genoa." With this piece, representing the downfall of a heroic nature carried away by the absorbing idea of unbounded ambition, Schiller opened the first series of his historical dramas which, at a later period,

immortalized his name and genius. "Fiesco," notwithstanding the inaccurate delineations of the various characters, is one of the greatest of the poet's works and must take its place amongst the best productions of German dramatic poetry.

The reception of this piece by the public and the press was not so favourable as that of "The Robbers;" and again, as want and privation stepped in to cloud his imagination and noble soul, the poet accepted the invitation of a widow friend, Frau Henrietta Wolzogen, with whose sons he had studied at the Karls-Schule, to spend some time upon her estate, at Bauerbach, in Thuringia. In this secluded place Schiller enjoyed that tranquillity of soul so necessary for the healthy development of spiritual life. The delightful and romantic scenery around impressed him with all the charms of nature; his mind expanded more and more at the contemplation of the great beauty pervading the universe; and, in order to show the different spirit prevailing through harmonious nature and discordant society, he completed, in this lovely place, his third tragedy, "Cabal and Love." In this work he endeavoured to prove that littleness of soul will always be defeated by greatness of soul. He was the first who was bold enough, in this production, to claim that nobility of soul should always have the preference over nobility of birth; notwithstanding the fact that society, in most instances, acts in opposition to principles proclaiming such an important law of humanity.

The publication of this play again drew upon him the attention of Dalberg who, in a flattering note, recalled him to Manheim for the express purpose of appointing him his theatre poet. In a country like England, where theatrical performances are not generally sanctioned by the people, such an appointment might be easily undervalued; but, in Germany, where the stage is considered as a medium through which the moral and national spirit is strengthened, and where, centuries ago, the great Luther himself approved of

religious, social and school dramas, re-echoed at the present time by the learned historian Gervinus, who asserts the theatre to be "the proper constitutional edifice for the realm "of poetry," such an appointment as theatre poet was both an honourable and a much coveted vocation.

Schiller, like Shakespeare under similar circumstances, not only acquired, through this office, a practical knowledge of theatrical life, but he also improved his ideas of the stage, and formed, by personal acquaintance, or by written correspondence, some of those alliances which have shed so much lustre on the hallowed name of friendship. As the sensitive poet, however, could no longer stand to battle with the arrogance of vain actors and actresses; and, as his dramatic taste was greatly at variance with the performances exhibited upon the Manheim stage, he very soon quitted an engagement which had so often put him in torture when witnessing the degradation of his poetic ideals. He left Manheim for Leipzig and, soon after his arrival in this city, entered into a bond of friendship with Körner, which union, forming a new tie of affection, contributed much to the completion of his earthly dreams. Encouraged by Körner and his amiable wife, Schiller finished at Dresden his celebrated "Don Carlos," a drama in which the poet places the youthful and noble-thinking Don Carlos in opposition to the blind and bigoted ideas of his father, Philip II of Spain. When this stern and unfeeling monarch ventured to marry the very princess to whom his son was affianced; and when, afterwards, he endeavoured to engraft, by sword and Inquisition, his religious fanatical ideas upon the Protestant spirit of his people in the Netherlands; then the loss of his own son and the emancipation of the Netherlands from the Spanish yoke showed him how dangerous it was to violate the rights of individual man and to offend the public spirit of a country by interfering with its religious convictions.

The most attractive character in the play is the Marquis of Posa who, closely united by ties of friendship to Don Carlos, is placed between father and son in order to impress, upon the former, not to sever affection and intellect from its natural growth; and, upon the latter, not to squander away the blessings of intellect and affection in passive idleness and morbid sentimentalism. One of the finest scenes of this drama is that in which Posa speaks to the king in favour of expansion of intellect and freedom of thought,—

"By the Almighty Power!
"Restore us all you have deprived us of,
"And, generous as strong, let happiness
"Flow from your Horn of Plenty. Let
"Man's mind ripen in your vast Empire;
"Give us back all you have taken from us,
"And become, amidst a thousand kings,
"A king indeed!"

"Renounce the mimicry of god-like powers which levels us to nothing. Be, "in truth, an image of the Deity himself. One pen-stroke now, one motion of "your hand, can new create the earth, can grant us liberty of thought. Look "round on all the glorious face of nature—on freedom it is founded. See, how "rich through freedom it has grown! The great Creator bestows upon the worm "its drop of dew, and gives free-will a triumph in abodes where loose corruption "reigns. O! devote yourself to your own people's bliss; restore the prostrate "dignity of human nature, and let the subject be, what once he was, the end and "object of the monarch's care, bound by no duty but a brother's love; and, when "mankind is to itself restored, roused to a sense of its own innate worth, when "freedom's lofty virtues proudly flourish, then, sir, you have made your own "wide realms the happiest in the world. Would you, alone, in Europe, fling "yourself down before the rapid wheel of destiny, which rolls on in its incessant "course, and seize its spokes with human arm? Vain thought! Already "thousands have your kingdom fled in joyful poverty. The honest Burgher, "for his faith exiled, was once your noblest subject. See! with a mother's arm "Elizabeth welcomes the fugitives, and Britain blooms in rich luxuriance from "our country's arts."

The publication of this drama was hailed with general approbation. A great many eminent men, and amongst them Wilhelm von Humboldt, expressed themselves upon it in the most laudatory terms.

Schiller, flattered by the reception with which it was greeted, and afterwards cherished by the quickening and elevating voice of true friendship, composed, in these hours of happiness, his celebrated "Hymn to Joy,"—a hymn, which has dispelled from many afflicted souls the dreary clouds of darkness in

which they were enveloped. This Hymn, "god-like spark," was set to music by several composers and, according to Paleski, Beethoven, in his ninth symphony, illustrated this idea. "When the music, languishing before the loving sen-"sations in the master's heart, struggled to find speech and "expression, it could find none more powerful than joy—"god-like spark!"

Animated by these feelings of joy, Schiller left Dresden for Weimar, thinking, in this metropolis of intellect, to enter into closer relationship with Goethe, Wieland and Herder, who resided there, and thus to attract the attention of the Duke, Karl August, who had lately conferred upon him the title of councillor and was known to be the friend and protector of poets and other literary men. But, unfortunately, on his arrival in Weimar, the Duke and Goethe had started for Italy; Wieland, of whom he had heard so much, displeased him by the light and frivolous tone of his conversation and writings; but Herder, a struggling nature like himself, possessing a stern and dignified demeanour, attracted him by the manliness, power and originality of his ideas. Schiller went often to hear Herder preach and said his sermons always pleased him more than any he had ever heard; but, though here he felt a great attraction, yet, in general, the social and intellectual atmosphere in Weimar did not quite come up to his previous expectations. The stiff court etiquette and aristocratic demeanour of all with whom he became acquainted had diffused a spirit of coldness and formality through the domestic life of the most distinguished families in the town. On this account he went to Rudolstadt and there engaged himself to a young lady, Lotte von Lengefeldt, whose deep affection afterwards shed so many happy moments over his gloomy and chequered life. Schiller felt more than any one else the pure joys of a tranquil home-life. In his letters to Lotte he confesses his delight at seeing the seeds of joy and love still living uninjured within his heart, to

ripen into blossoms by the warmth of her affection. But there was one thing which marred the happy anticipations of his future, the thought of his inability to "maintain a "wife." "To be entirely happy," he writes to Lotte, "I must "live in a condition free from care and anxiety and not depend "on the productions of my brain." On this account Schiller was anxious to find a more lucrative position and as, in the meantime, the "Revolt of the Netherlands," an historical work of his, was published, Goethe availed himself of the occasion to secure to the poet a professorship of history at the university of Jena. This appointment led to his marriage and to a life of domestic felicity of which he, at a later period, says, "When I am overwhelmed with occupation it makes "me happy to know that my wife is near me and that her "love and care hover around me. The youthful purity of her "soul and the fervour of her love inspire me with a degree of "peace and harmony which, in my hypochondriacal state, it "would be otherwise impossible for me to attain."

Schiller threw all the fire of his soul into his historical lectures, he attracted the students by the magic power of his heaven-born countenance and by the flow of his eloquence and, in order to allow his thoughts a larger scope for reflection and development, he penetrated with all the zeal of a scholar into the profound philosophy of Kant. A severe illness, the forebodings of painful and severe sufferings which, at a later period, terminated in his death, interrupted his philosophical studies; but, fortunately, the loving devotion of his wife, the calmness of his mind impressed with philosophical ideas, and the close intimacy with his friend Wilhelm von Humboldt, who, with his classical spirit, introduced him to the rich intellectual treasures of the ancients, were potent means to promote his gradual recovery and to call forth again in him that powerful animation of soul which found its best expression in his poetical creations.

About this time Schiller and Goethe became fast friends; topics of mutual interest formed the subject of an animated correspondence between them and led to that genuine friendship which brought all their sterling virtues and eminent talents into inseparable union. Goethe alludes to this happy intercourse in one of his letters to his friends, saying, "It was "a glad spring to me, in which all seeds shot up and gaily "blossomed in my nature." The first fruits of this alliance were Schiller's letters on the æsthetic education of man, in which he points out that "it is the duty of man to embellish and "invest his existence with the graceful and the beautiful, for, "while they reconcile external nature to our inward percep- "tion, they are our true deliverers from the dominion of the "senses, which they do not, indeed, subvert, but place in "affinity to that of the spirit." Moreover, as both the poets joined in publishing a literary paper, called the "Horen," and, as Schiller's idealistic and Goethe's realistic nature are the only two directions in the human mind which, in their mature development and union, lead to perfection; so they strove to effect a reconciliation in their poetical life between the contrasts of reason and sensuousness, nature and culture, ideality and reality. But, when their efforts to expand the educational standard of the nation met with no encouragement, when they saw that the tastes of the multitude were depraved and the literary opinions of professional men without greatness of judgment or depth of sentiment, they relinquished the publication of the "Horen" in order to reappear before the public with a poetical Almanac, in which they, in short satirical epigrams, called "Xenien," made a deadly onslaught against everything that was common, prosy, superficial and unpoetical. Through this warfare they offended a great many second-class talents; and men like Nicolai, Lavater, Reichardt and Schlegel for a long time smarted under the wounds which they received. At this period, animated by his historical work, the "Thirty

"Years' War," Schiller began to compose his greatest dramatic production, "Wallenstein." In this play the poet places his hero between the two absorbing ideas of human passion, revenge and ambition. The great soldier who won so many battles for his Emperor was, after his first brilliant and successful campaign, ungraciously dismissed by his sovereign at the Diet of Regensburg; and when, later on, after several defeats of the imperial regiments, he was again requested to place himself at the head of the army, he willingly followed the voice which called him back to his former dignity and rank, but not without the firm determination to revenge himself for the insults he had suffered. Yielding to his ambitious spirit he led over his army to his enemies, the Swedes, thus purposing to emancipate himself from the Emperor and become royal master of Bohemia. These feelings of ambition were nurtured in Wallenstein by his strong belief in the stars, those types of fatality, as proved by the following observations of the Duchess, his wife:—

"When his ambition was a genial fire, not that consuming fire which now it "is, the Emperor loved him, trusted him, and all he undertook could not be "but successful, but, since that ill-starred day at Regensburg, which plunged "him head-long from his dignity, a gloomy uncompanionable spirit, unsteady "and suspicious, has possessed him, and turned his heart and best affections to "all those cloudy sciences which have never yet made happy him who followed "them."

But, as it often happens that the very means through which we sin are the instruments by which we are punished, so it was in this instance with Wallenstein. He pretended to advocate, when with the Emperor, the petition of his ambitious General, Butler, soliciting his sovereign to confer upon him the title of Count, but, in fact, he dissuaded him from doing so; and when this request, through Wallenstein's double-dealing, was refused by the Emperor, and the petitioner at a later period was informed of the faithless conduct of his great protector, ambitious Butler, hurt in his innermost feelings, turned his whole heart into one

expression of revenge towards his deceptive friend and, afterwards, became the principal cause of his destruction. Thus we hear him exclaim,—

"The Duke was ever a great calculator, his fellow men were figures on his "chess board, to move and place as his game required. Other men's honour, "dignity and good name did he shift like pawns, and made no conscience of. "Still calculating, calculating still, and yet at last his calculation proves erroneous."

In opposition to these two men, stimulated by ambition and revenge, the poet places before our eyes two other characters of a higher and nobler cast, characters which, in the person of Max Picolomini and Thekla, combine in their thoughts and feelings the purest sentiments of love, truth and honor. The sterling principles of Max's soul are revealed to us in his reply to his father, saying, "O! hadst "thou always better thought of men, thou hadst then acted "better; curs'd suspicion, unholy, miserable doubt; to him "nothing on earth remains unavenged and firm who has no "faith."

Placed between his love for Wallenstein's daughter, Thekla, and his pledged honour to his Emperor and Fatherland, Max tears himself away from the arms of love to follow the call of honour, strengthened in this resolution by the words of Thekla,—"Being faithful to thine own self, thou "art faithful, too, to me. If our fates part, our hearts remain "united." We cannot better eulogise the character of Thekla than in the words of her own father, when he says, "Come "here, my sweet girl, seat thee by me, for there is a good spirit "on thy lips; a voice of melody dwells in thee which doth "enchant the soul."

The incessant mental labours which kept up a continual excitement in all the organs of his body exercised a fatal influence on Schiller's hitherto delicate health. He was several times prostrated on a bed of sickness, and it was only owing to the unremitting care of his loving wife and sympathising friends that the sparks of life were so often

rekindled in him. Besides this, the pressure of household cares, occasioned by pecuniary embarrassment, cast many melancholy clouds over his lonely hours. Too sensitive and high-minded to reveal his straitened circumstances to the world, and too proud and independent to receive assistance from his friends, the poor poet fed the vulture of poverty in his consumptive breast. In such moments of mental and physical prostration he resolved, by various peculiar means, to raise his drooping spirits. It is said that the sight of crimson curtains animated his genial spirit. Goethe also tells us the following remarkable fact relating to our poet's life: he (Goethe) one day said to his friend Ekermann, "I called on Schiller and, not finding him at home, I "seated myself at his writing table. I had not been seated "long, when I felt a strange indisposition steal over me, "and I nearly fainted. I did not know to what cause I "should attribute this wretched state, until I discovered a "dreadful odour issuing from a drawer near me. On opening "it, I found, to my astonishment, that it was full of rotten "apples; meanwhile his wife came in and told me that the "drawer was always full of rotten apples, because the scent "was beneficial to Schiller and he could not live nor work "without it." However, the germs of death, although deeply seated within his feeble body, did not prevent him from continuing his poetic labours. Soon after he had finished his "Wallenstein," his genial soul created the beautiful tragedy of "Mary Stuart." Schiller has been accused of showing too much sympathy in this tragedy with the heroine Mary Stuart, and it has been said that, in consequence of this favour, he became the advocate of religious principles which were foreign to his Protestant conscience. We could never understand how such imputations could be cast upon a man whose numerous writings were never biased by dogmatism or creed, but contain the purest expressions of sympathising humanity. We

should rather say that, through the fall of Mary Stuart, and her Roman Catholic principles, the poet placed himself on the side of Elizabeth, the enthusiastic defender of Protestant rights and convictions.

Indeed, it is absurd to accuse Schiller of having religious sympathies of a partial character; he, like every genuine poet, stands above all contending principles; and, if his sentiments were too strongly expressed in Mary's favour, he only shows, by this predilection, the compassion he has for a human being, so nobly constituted, falling by her weakness and impetuosity of heart. This weakness is evident from her own confession, in the following lines:—

"'The long atoned crime arises fresh
" And bleeding, from its lightly covered grave.
" My husband's restless spirit seeks revenge;
" No sacred bell, no host in priestly hands,
" Dismiss it to the tomb. I did not murder him,
" But it was known to me; I suffered it,
" And lured him with my smiles to death's embrace."

Her impetuosity is revealed to us in the ensuing scene with Elizabeth. Instead of using the language of moderation, Mary gives full vent to the passionate emotions of her heart, insults her inveterate foe before her minion and thus precipitates her own ultimate fate. Thus we hear her exclaiming,—

" My sins were human, and the faults of youth.
" Impulse of heart misled me. I have never
" Denied or sought to hide it. I despised
" All false appearances, as became a queen.
" The worst of me is known, and I can say
" That I am better than the fame I bear.
" Woe to you when, in time to come, the
" World shall draw the robe of honour
" From your deeds, with which the arch-hypocrisy
" Has veiled the raging flames of lawless court life.
" Virtue was not your portion from your mother;
" Well know we what it was which brought
" Her head upon the fatal block."

What a lesson this scene teaches to all those who, in critical moments of life, give unbridled license to their tongue.

The academic atmosphere in Jena, with its learned but prosy professors, and the noisy and unpoetical life of wild pleasure-seeking students, no longer pleased the poet, whose nerves were irritable and excited and whose soul was yearning for congenial recreation and elevating impressions. For this reason, about the year 1800, he removed from Jena to Weimar, in order to live in the vicinity of intellect; to enjoy daily intercourse with Goethe and enliven his dramatic genius by often witnessing theatrical performances on the Grand Ducal Stage.

About this period the whole world was startled and interested in the second Prometheus—Napoleon, who, by the power of his military genius, not only smothered the raging flames of revolution, but also carried his sword into foreign countries. Schiller, anticipating, perhaps, in his prophetic mind, that the successful warrior might lead his troops for purposes of conquest into the sacred soil of his native land, favoured his nation, at the right hour, with two dramatic works. These were the "Maid of Orleans" and "William "Tell," which, both in their spirit and tendency, fostered and awakened amongst the German people a spirit of the purest patriotism and contributed much, at a later period, to drive away the foe from the sacred home-steads of the people.

We do not fully enter into the historical facts and events upon which the "Maid of Orleans" is based. We only observe that, at the time when France, split into two parties, the Orleanists and Burgundians, lay prostrated at the feet of England; and Orleans, the last stronghold, was about to surrender itself to its foes, a peasant girl (Joan of Arc), inspired by a holy impulse, placed herself at the head of the dismayed army, raised the siege of Orleans, defeated the enemy and crowned her sovereign, Charles the tenth, at Rheims. Schiller made use of these historical materials to create from them the most interesting tragedy of modern times.

The love of country, so powerfully kindled in the maiden as to claim her whole devotion to warlike purposes, places her in conflict with her womanly mission, which consists in spreading out the blessings of peace, love and affection over the world.

Warlike propensities and womanly sentiments, however noble the cause may be, are so naturally opposed to each other that, where the one reigns, the other must necessarily take to flight. This we learn from Johanna and Montgomery, where the former, not yielding to the request of the young Welshman, to save his life, justifies his approaching death with the following words :—

Montgomery : " O ! by love's sacred all-pervading power,
" To whom all hearts yield homage,
" I conjure thee ; I left behind a bride,
" Beauteous as thou, and rich in blooming grace.
" O ! if thyself dost ever hope to love ;
" If in thy love thou hopest to be happy ;
" Then ruthless sever not two gentle hearts,
" Together linked in love's most holy bond.

Johanna : " Of love's bond, by which thou dost conjure,
" I know nothing, nor ever will I know
" His empty service. Defend thy life, for
" Death does summon thee !

Montgomery : " It is hard in foreign lands to die unwept."

If the Maid of Orleans had remained faithful to her vow, to renounce all earthly pleasures and to devote herself entirely to her patriotic work, she might have carried out her great and stern mission in harmony with those principles which she at first acknowledged. However, nature cannot part from itself. At a second encounter she meets the English officer Lionel, whom she is just going to kill when, on gazing into his face, she is seized with a sudden and deep-felt love which induces her to spare the enemy. This weakness sets her at variance with her mission. She loses the purity of her patriotic sentiments ; and, being taken prisoner for the holy cause she defended, dies, uttering the words, " Brief is the sorrow, endless is the joy."

What induced Schiller to put the highest ideals of patriotism in the breast of a woman we do not know. It was, perhaps, his intention to place before his nation, after they had witnessed so many representations of false patriotism in the French Revolution, a pure, virgin-like example of real national grandeur in the Maid of Orleans. But, again, thinking that the feelings of patriotism cannot excite such a powerful and idealistic expression in the heart of a woman as it does in that of a man, he composed his last and most attractive work, "William Tell." In this drama, he proclaims the triumph of individual liberty over all the machinations of tyranny. Moreover, it seems to us as if he, through this production, intended to impress upon his countrymen the truth that every national idea gains the victory over inimical obstructions by unity and strength of purpose. But, for the accomplishment of these great aims, it is necessary that every country should possess women imbued with the spirit of Gertrude, who exclaims,—

"Many a time, as we sat spinning, in the winter nights, my sisters and "myself, the people-chiefs were wont to gather round our father's hearth, to read "the old imperial charter, and to hold sage converse on the country's weal; then, "heedfully, I listened, marking well what, or how, a wise man thought, a "good man wished, and garnered up their wisdom in my heart."

And, in union with this spirit of Gertrude, the patriotic spirit of all times stands in need of men impressed with the beautiful words of Attinghausen,—

"Deluded boy; despise the land that gave thee birth?
"The day will come, when thou, with burning tears,
"Wilt long for home and for thy native hills.
"O! potent is the spell that binds to home.
"No, no, the cold false world is not for thee;
"In the foreign land, with thy true heart,
"Thou wilt for ever feel a stranger amongst strangers."

With this drama Schiller concluded his poetical career. His feeble body was entirely exhausted by his mental labours and excitement; he needed stimulants to keep up his shattered constitution; and yet, often in the midst of the most painful sufferings, his great and genial soul dwelt in soothing meditation

upon the love of his wife and family and upon new poetical conceptions with which his teeming mind supplied him so abundantly.

Under the influence of some alarming symptoms Schiller entered the spring season of 1805, when, on the 6th May, a rheumatic fever threw him on a sick-bed, from which ruthless death released him on the following day. A few hours before he expired he expressed his desire once more to see the setting sun. The curtain was drawn aside and, gazing with cheerful and serene countenance, he thus bestowed on Nature his last farewell kiss; vernal breezes wafted his immortal soul to the shores of the infinite spirit, beyond the confines of this terrestrial world.

I must crave your pardon for having protracted my paper to an unusual length; and yet, notwithstanding this, I have only given you a scanty and meagre sketch of the Poet's Life and Works. I have not mentioned to you his romances, ballads and songs, which will live for ever in the heart of every German. Amongst these songs none stands higher than the "Song of the Bell," in which the poet, according to the Latin motto, "*vivos voco, mortuos plango, fulgura "frango,*"—I call to the living, I lament the dead, I control the lightning,—describes, in poetical and refined language, all the joys and afflictions of toiling man. Everything that beautifies the life of hard-working man,—as home-happiness, love of liberty, moderation and piety,—sounds in pleasant accents on our ears. German critics have very often compared Schiller with Raphael, the great painter. No artist, they say, has painted the human face with a grace and majesty like Raphael's, and no poet has endowed the soul of man with such celestial charms as Schiller; as the spirit of physical beauty rests upon the works of the one, so the spirit of moral beauty pervades the poetry of the other.

We fully assent to this opinion and, by force of it, we

strongly advocate the study of Schiller's works in houses and families where it is the desire of parents to awaken in their children a love for sound principles and refining ideas. Some passages from Schiller far out weigh all that modern rubbish and exciting literature which we so often find in the hands of our youth and maidens; besides, if life be more than an existence spent in common pursuits and trivial aspirations; if it be a divine gift, containing in its substance the joys and blessings of humanity, then, we do not know any man who has given these ideas a more congenial expression than Schiller the poet,

> "Who digged and delved through light and gloom;
> "And digged and delved till he found a tomb."

With this we conclude the life of our immortal bard, whose endeavours tended to invest the heart of man with the charms of love and harmony; and who, at the commencement of this century, drew from his melodious soul the elevating words,—

> "To the heart's still chamber, deep and lonely,
> "Must thou flee from life's tumultuous throng;
> "Freedom in the land of dreams is only,
> "And the beauteous blooms alone in song."

ON MICRO-GEOLOGY.

By Edward H. Birkenhead, F.G.S.

(Read 18th December, 1862.)

The object of the present paper is to pass in review those contributions to the science of Geology which have been effected by the aid of the Microscope, and to make suggestions with regard to some points upon which further investigation by the same means is desirable.

I have no desire to exalt microscopic Geology to the dignity of a separate science; it is rather to be regarded as a subsidiary branch of physical, chemical and organic Geology, enabling us to extend and complete our studies of many terrestrial changes which, without its aid, would be incomprehensible.

In order to make himself acquainted with the nature and past history of a rock the geologist examines its lithological character and its organic remains. In each of these divisions of the subject the microscope is indispensible. I propose to begin with the Palæontological evidence furnished by the microscope; commencing by considering the assistance it has rendered in furnishing characters for the discrimination of various members of the animal and vegetable kingdoms, and afterwards passing on to notice the different formations where the knowledge thus obtained has been applied.

It will be convenient to consider animated beings under the three heads of Animals, Plants and Infusoria, including under the latter term all the organisms, whether animal, vegetable

or doubtful, which are so minute as to form, of themselves, objects for microscopic examination.

Plants. The cases where the microscopic structure of a plant is preserved in its fossil state are somewhat exceptional. Usually we may expect vegetable matter lying under water to undergo decomposition and disintegration before it becomes so covered with sediment as to arrest further change of this nature. Nevertheless we have many instances where the distinctive characters of exogenous and endogenous wood can be clearly made out, occasionally by the naked eye. In the Tertiary leaf-beds the botanist finds nearly all the characters of the living plant; in lignite the woody structure is apparent to the eye; but it is when we come to examine coal that we require the microscope to accompany us even in the first steps. Doubtless there is much of this substance which underwent disintegration before it was consolidated; but in favourable specimens it is not difficult to obtain evidence of structure. In many cases we have presented to us the glandular woody tissue characteristic of the Coniferæ; and it has even been sought to ascribe such specimens to living genera, as *Pinus* and *Araucaria*, by the arrangement of the glands. We are not, however, entirely without the preserved remains of Angiosperms; and one reason why there are not more is doubtless the fact that their tissues are very rapidly destroyed by exposure to water.

In the division Cryptogams we have abundance of ferns; and the microscope not unfrequently reveals the presence of their peculiar form of vascular tissue. Equisetum stems are said to occur in the leaf beds of the Isle of Mull.

It is when portions of plants become silicified, that their structure is most beautifully preserved; in this case the vegetable matter has been removed, and replaced, atom for atom, by silex: thin polished sections then shew their most minute characters. Palms and Dicotyledons are frequently

so found. On the whole, however, the fossil botanist looks to characters, other than those which are microscopical, for the discrimination of his specimens.

Animals. With few exceptions it is the hard parts of animals which are alone preserved in the fossil state. The exceptions, however, are instructive and lead us to expect further evidence of the same kind. Thus we have hair in good preservation, as in the case of the Siberian mammoth and rhinoceros, and in that of the fossil bones of Escholtz Bay, which have lost but little of their animal matter and which are dug up accompanied by hair. We have feathers of birds which have left very accurate traces in the remarkable fossil from the lithographic slate of Solenhofen, recently described by Professor Owen and by him called *Archæopteryx longicaudata.* The firm integument of Ichthyosauri is often evident, showing to what we are indebted for the wonderful state of preservation in which we find their skeletons.

The *scales* of fishes and reptiles are in many cases valuable as serving to indicate the affinities of the animal which once possessed them. The microscopic examination of "ganoid" scales shews that they are composed internally of bone and externally of enamel; and it also exhibits the presence of lacunæ, canaliculi and Haversian canals as in ordinary bone. The preservation of the vast numbers of ganoid dermal skeletons is due to the large amount of earthy matter contained in them.

When we come to *bone* the microscope again renders great assistance, although it is in most cases subsidiary to the more important investigation founded upon the outward form and size of the specimens. It may, however, be remarked that "in birds the Haversian canals are more numerous and "smaller than in the mammalia, and frequently run in a "direction at right angles to the shaft; the lacunæ are also "smaller and more numerous. In reptiles the Haversian

"canals are few and very large; the lacunæ and the canali-
"culi are also very large, and the latter very numerous. In
"fishes the structure is more irregular; there are no con-
"centric laminæ; the Haversian canals are sometimes absent,
"at others very large and numerous, frequently the lacunæ
"are absent, while the canaliculi are unusually long and
"elegantly wavy and branched." Thus we have a means, which we may venture to consider trustworthy, of discovering the affinities of vertebrated animals, especially when we have once established the class to which they belong. We may, for instance, infer the sauroid relationship of a fish or the batrachian character of a reptile from data furnished by microscopic examination. Thus Professor Quekett examined certain bones found by Dr. Falconer in the North of India, and pronounced them to be certainly reptilian and probably chelonian; this induced Dr. Falconer to conclude that they were the toe bones of the colossal tortoise, twenty feet long *(Colossochelys atlas)* of which he had previously found the carapace in the Sewalik hills. Again, some fragments of bone which were found in a chalk pit and were referred by Professor Owen to the class of birds, on examination by the microscope indicated reptilian affinities; and it was thus shewn that they might safely be ascribed to one of the great flying lizards of the secondary rocks, the Pterodactyls.

In the *teeth* of vertebrata we have many interesting differences of structure, discernable only by the microscope. I need not remark that one of the most important Palæontological characters of teeth is the manner in which they are fixed to the jaw; but beyond this we find that in many fossil ganoid fishes a labyrinthic structure is apparent, the external layer of cement converging by numerous convoluted folds towards the central cavity of the tooth. The genus Rhizodus was originally founded upon teeth from the Devonian and Carboniferous formations which possessed this character. The teeth of the

Labyrinthodon of Warwickshire and of the Mastodonsaurus of Wirtemberg shew this structure in a most remarkable degree; and the inference was drawn that, if these animals were reptilian, they would probably turn out to be related to the class of fishes; in some members of which we find the same structure of the tooth. The conclusion was borne out by the subsequent discovery and examination of other portions of the skeleton, indicating that the Labyrinthodon or Mastodonsaurus was Batrachian in its characters. Again,—"a rock-"formation extends over many parts of Russia, whose mineral "characters might justify its being likened either to the *old* "or to the *new* red sandstone of this country, and whose posi-"tion, relatively to the other strata, is such that there is great "difficulty in obtaining evidence from the usual sources as to "its place in the series. Hence, the only hope of settling "this question, (which was one of great practical importance, "since if the formation were *new* red, coal might be expected to "underlie it, whilst if *old* red, no reasonable hope of coal could "be entertained,) lay in the determination of the organic "remains which this stratum might yield; but unfortunately "these were few and fragmentary, consisting chiefly of teeth, "which are seldom perfectly preserved. From the gigantic size "of these teeth, together with their form, it was at first inferred "that they belonged to Saurian reptiles, in which case the "sandstone must have been considered as [probably] new red; "but microscopic examination of their intimate structure "unmistakeably proved them to belong to a genus of fishes "*(Dendrodus)* which is exclusively Palæozoic, and thus "decided that the formation must be old red."—(Carpenter.) Another instance is furnished by certain teeth similar to those of the *Cestracion* or Port-Jackson shark, and referred to the genus *Acrodus*—they are found throughout the whole of the secondary rocks. From their peculiar form they are called by quarrymen "fossil leeches," and the older fossilists regarded

them as petrified Vermes; but the structure, as shewn by the microscope, is closely similar to that of the teeth of Cestracion. (See Owen's *Odontography*.)

Passing to the Invertebrata we find microscopic characters of great importance in some of the divisions of the Mollusca. In many of the Cephalopoda there is an internal shell—the "cuttle-fish bone," which exhibits a very beautiful and remarkable structure. The outer shelly portion of this body consists of horny layers alternating with calcified layers, in which last may be seen a hexagonal arrangement like that present in the hinge tooth of *Mya arenaria*. The soft friable substance that occupies the hollow of this boat-shaped shell is formed of a number of delicate plates, running across it from one side to the other in parallel directions, having the appearance of millions of microscopic pillars. The shell thus becomes sufficiently light to float in water, and by its buoyancy assists in the motion of the animal. Most of the fossil cuttle fishes, however, are those which, like the Nautilus and Ammonite, possess external shell, having much the same structure that we find in bivalves. In some of the oldest fossil genera, *actinoceras*, *gyroceras* and *phragmoceras*, the siphuncle, or passage connecting the different chambers, is large, and contains in its centre a smaller tube, the space between the two being filled up with radiating plates, like the lamella of a coral. Another point of interest in connection with Cephalopoda is the fact that the Ammonites closed their shells by a horny or shelly operculum. In the round-backed Ammonites the operculum is shelly, and in its internal structure it resembles the cancellated tissue of bones.

The shell of the *Brachiopoda* is so characteristic that the examination of a minute fragment is sufficient to determine the class. According to Dr. Carpenter it consists of flattened prisms of considerable length arranged parallel to each other with great regularity, and obliquely to the surfaces of the

shell. Besides this, in most brachiopoda the shell is traversed by canals from one surface to the other, nearly vertically, and occurring regularly, the distance and size of the perforations varying with the species.

It may be well to notice here, that the structure of shell in specimens from old formations, is often made out only with difficulty. Carbonate of lime, whatever be its original form, shews a strong tendency to pass into a crystalline condition by a change in molecular arrangement. Thus in fossil crinoids we often discover that although the outward form of the animal is preserved, yet it breaks up without difficulty into fragments, having the characteristic rhombohedral fracture of calcareous spar. We have a ready explanation of this phenomenon in the power which water possesses, when containing carbonic acid gas, of dissolving carbonate of lime; and of re-depositing it again in the crystalline condition, when the carbonic acid escapes from solution. Incrustations of carbonate of lime due to this cause and found in conduit pipes, shew crystalline structure in a very marked degree. We are not surprised, therefore, to find that a similar effect has been produced in old fossil shells, whether of mollusca or of other classes of animals, if composed of carbonate of lime.

The shell of Echinoderms is highly characteristic, being composed of a network of calcareous matter more or less regular, and familiar to microscopic observers. The plates are often furnished with calcareous appendages, tubercles, spines, hooks, "anchors," etc., all forming exceedingly interesting objects. Count Münster has figured the microscopic plates, apparently of a *Holothuria*, from the chalk of Warminster; and the anchor of a *Synapta* from a still older formation,—the upper oolite of Bavaria. "Microscopic "observers will doubtless meet with many such detached "plates and spines, when searching for Polycystineæ and

"other Rhizopods in the oolitic and cretaceous strata." (Owen's *Palæontology*.)

The very peculiar compound eye of the Trilobite is shewn with great clearness by the microscope, which thus adds considerably to our knowledge of the life-history of these remarkable creatures.

I need say but little of the remains of corals and bryozoa; their examination of necessity includes the arrangement of their septa and other internal parts, which in many cases can only be done by the microscope.

The hard parts of sponges are the spiculæ which they contain; these, which are generally siliceous—sometimes calcareous—vary considerably in form even in the same specimen; so that they can hardly serve to distinguish genera, although they enable us to form an idea of the *class* of organism with which we are dealing. In some agates and flints we find preserved even the fibrous portion of the sponge.

Infusoria.—The organisms included under this term, though for the most part extremely minute, are in the aggregate amongst the most active and powerful agents of physical change. By their countless numbers, their rapid multiplication, and their wide distribution, they produce results which fill the mind with astonishment.

I will for a moment refer to the Desmidiaceæ. We often find in flints from the chalk formation a number of minute globular bodies, set with radiating hooked spines, resembling the organism Xanthidium. On that account these Spiniferites were referred to Desmidiaceæ, and called Xanthidia. Existing members of this group, however, are solely freshwater; and Owen remarks that the Spiniferites are certainly marine bodies, and probably the spores of sponges.

The divisions of Infusoria which are most interesting to the

geologist, are the Foraminifera, the Polycystina and the Diatomaceæ.

The Foraminifera and Polycystina belong to that branch of the Animal Kingdom which is now generally called Protozoa, and to that division of it characterized by the absence of any permanent mouth. The Astomatous Protozoa are typified by the common Amœba so well-known to microscopists, which with its allies forms the group Rhizopoda, distinguished by their property of sending out portions of the body, as processes or "pseudopodia," in any direction whatever; by means of which they travel and obtain food.

The Foraminifera are minute Rhizopoda provided with calcareous shells of the most diversified and, at the same time, of the most beautiful forms. In one division the shells are perforated by minute apertures through which the pseudopodia are extended; in the rest the substance of the shell is imperforate, so that all nourishment has to be obtained through the opening or mouth of the shell or of its last chamber.

The animal has often the power of building successive chambers, much like the Nautilus and allied Cephalopods; the earlier naturalists consequently placed the Foraminifera amongst the Cephalopoda, but the examination of the body substance shewed the structure of the animal to be perfectly simple and homogeneous. The manner in which the various chambers of the shell are joined and arranged has been used for the classification of the group; but it has long been felt that the principle was not sound; and Dr. Carpenter, in his new work on Foraminifera, shews that it is not at all to be relied on, the limits of variation being far wider than was previously supposed.

The *Polycystina* are allied in character to the Foraminifera—their shells are perforated, and generally spinous. None can examine them without allowing their exquisite beauty. An

important peculiarity is the fact that their shells are siliceous instead of calcareous.

Lastly, the *Diatomaceæ* are organisms which have been cast backwards and forwards between the zoologist and botanist, but which are now usually considered as belonging to the Vegetable Kingdom. They are important to the geologist as possessing a siliceous covering, which may be practically regarded as indestructible. Every microscopist is acquainted with the beautiful and varied appearance presented by their valves, and with the fact that endless controversy has taken place with respect to the precise nature of the markings on those valves.

It may be well to take a brief view of the scale upon which these various organisms are working at the present day.

Foraminifera. In the soundings of deep seas beyond the tropics, these animals are brought up in great abundance. Captain Dayman, R.N., states, that "between 15° and 45° "W. long., lies the deepest part of the ocean between Ireland "and Newfoundland, varying from about 1,500 to 2,400 "fathoms, the bottom of which is almost wholly composed of "soft mealy substance, which, for want of a better name, I "have called oaze. This substance is remarkably sticky, "having been found to adhere to the sounding rod and line "through its passage from the bottom to the surface, in some "instances from a depth of more than 2,000 fathoms." We have thus a length of more than 1,300 miles, in which only two exceptions occurred to the above description of sea bottom. When the mud is dried it resembles chalk in appearance and properties, possessing a tolerable consistency. Professor Huxley examined the sediment microscopically; and he believes 85 per cent. of the whole belong to one species of the genus Globigerina; 5 per cent. to other calcareous organisms of at most four or five species, and the remaining 10 per cent. consists partly of minute granules of quartz

and partly of animal and vegetable organisms, (including diatomaceæ) provided with siliceous skeletons and envelopes.

This instance is highly instructive. We observe first that there is thus provided a means by which the carbonate of lime dissolved and brought down by rivers, and by them poured into the sea, is absorbed and again separated in the solid form by the secreting power of these innumerable minute organisms. It is true that ordinary testacea, as the shell-bearing mollusca, play the same part; but it appears to me that in the effect produced, their labour is unimportant when compared with that of the Foraminifera. The only other class of animals which can compete with these latter in the work of separating carbonate of lime from the water of the ocean, is the great class of corals, which bring about in tropical seas the same result as that obtained in extra-tropical regions by the agency of microscopic Rhizopoda. We have in the Atlantic Ocean the materials for the formation of a bed of chalk or limestone, which we may put down as having an area of at least six hundred thousand square miles, and which in the course of ages may attain to an enormous thickness.

Another reflection occurs to me. Let us suppose the bed of soft porous limestone so formed, to rise from the ocean, and become dry land. It is exposed to the action of water which, being in contact with the atmosphere, will contain carbonic acid and will thus acquire the power of dissolving carbonate of lime. The water, in percolating through the various layers of the porous limestone, will dissolve a portion of the carbonate of lime from the upper layers; and subsequently, as its carbonic acid escapes, it will re-deposit it again in the solid form in the lower layers. But, in this process, the carbonate of lime will be deposited in a crystalline condition and will naturally arrange itself round the particles it already finds, namely, the shells of the Foraminifera etc. By a continuance of this action, we shall have the lower layers of

the soft calcareous formation gradually converted into a more or less compact rock, composed of small globular grains, formed by the successive deposition of layers of carbonate of lime round a microscopic shell or other fragment. In other words, we shall thus obtain an oolitic limestone of the ordinary character. By a further continuance of the same change, or by the action of other causes which it is not the place here to consider, the oolitic character may be lost, or the original substance may pass directly into the condition of a compact or crystalline limestone. We see something analogous in the change of structure to which I have referred when speaking of the shells of fossil mollusca from old formations.

It has been shewn, by Bischof, that the water of the sea contains five times the amount of carbonic acid which would be requisite to hold in solution the quantity of carbonate of lime it actually contains; or in other words, the amount of carbonate of lime in sea water must rise to five times its present amount before any would be precipitated chemically. It is possible that such a precipitation might occur locally to a small extent; but I am referring to the ocean as a whole. Hence we know of no means by which a limestone rock can be formed in the sea except the agency of organic beings; which we have seen to consist mainly of corals and rhizopoda.

The N.E. coast of Australia with its associated coral reefs has been ably described by Professor Jukes. He states that the "bottom" between the "inner reefs" of the great Australian barrier, when brought up by the dredge from a depth of fifteen or twenty fathoms, often looked very like the unconsolidated mass of some of the coarse shelly limestones to be found among the oolites of Gloucestershire. At other times the dredge came up completely filled with the small round Foraminifera called Orbitolites, and these organisms seemed in some places to make up the whole sand of the beach,

either of the coral islets or of the neighbouring shores. In the deep sea around, and in all the neighbouring seas, from Torres Straits to the Straits of Malacca, whenever "bottom" was brought up by the lead, it was found to be a very fine-grained, impalpable, pale olive-green mud, which was wholly soluble in diluted hydrochloric acid. This substance, when dried, would therefore be scarcely different from chalk, though it was commonly of a greener tinge. This fine calcareous mud may be partly derived, like the oaze of the North Atlantic, from the calcareous bodies of minute animals that live either on the surface or in the depths of the seas at the bottom of which it is found; but much of it is doubtless derived from the waste of the coral reefs themselves.

Polycistina. Shells of this class are found in deep sea soundings associated with the shells of foraminifera, as in the mud of the Gulf of the Erebus and Terror, and in the mud of the North Atlantic. Soundings of the gulf stream near Key Tiscayne, Florida, varying in depth from 147 fathoms to 205 fathoms give a light greenish-grey mud composed of Foraminifers, Diatoms, Polycystins and Geolites, in a profusion only surpassed by the fossil polycystinous strata of Barbadoes. The Foraminifers compose the largest part of these muds.

Diatomaceæ. These organisms, generally far more minute than the smallest testaceous Rhizopoda, produce by their numbers the most surprising results. They appear to be universally distributed whenever there happens to be a collection of water in which they may live and multiply. According to Ehrenberg, there are formed annually in the mud deposited in the harbour of Wismar, in the Baltic, 17,946 cubic feet of siliceous organisms. Although it takes a hundred millions of these to weigh a grain, Ehrenberg collected a pound weight of them in an hour. According to the same authority the water of the Mississippi at Memphis, carries down in every second

147 cubic feet of solid matter, in which are contained from 2 to 3 cubic feet of infusoria. The Nile carries down every second 130·9 cubic feet of mud, containing from 6 to 13 cubic feet of infusoria. And the Ganges with 557 cubic feet of mud per second, conveys from 69 to 139 cubic feet of infusoria, the latter number forming 25 per cent. of the whole sediment. The greater portion of the infusoria will doubtless consist of diatomaceæ.

Dr. Lorenz in describing the Gulf of Quarnero at the N.E. end of the Adriatic, says, "the vegetable organisms of "the Quarnero are distributed among one super-littoral and "four marine zones, having their maxima at the respective "depths of ½, 8, 20 and 45 fathoms. The higher these "zones the more they number new forms and bear a charac-"teristic type. The Diatomaceæ analogous in this respect to "the animal organisms, follow a different rule of distribution, "their new forms becoming more numerous with increasing "depth. The habitats of nearly 600 species of *Algæ*, (among "which are about 300 Diatomaceæ), have been ascertained."

In warm latitudes and seasons the water of peat bogs and stagnant water of all kinds swarm with infusoria, and the siliceous shells of those which are so covered, (chiefly the Diatomaceæ), have been found beneath peat bogs forming strata of many feet in thickness and co-extensive with the turbary, forming a siliceous marl of a pure whiteness. The "bergmehl" or mountain meal of Sweden is a fine powdery substance deposited upon the shores of the lake near Urania. It is used by the poorer inhabitants, when mixed with flour, as an article of food. It consists in great part of siliceous shells of infusoria with a little organic matter.

I remarked that we have in foraminifera potent agents for removing carbonate of lime from water and depositing it in the solid form. In the same manner we may view Polycystina, Diatomaceæ and Sponges as agents whereby

silica is separated from water containing it in solution. The changes to which a deposit so formed would be naturally subject subsequently, are not very clearly understood; but we have all we require to account for the formation of a siliceous rock or of a siliceous portion of another rock, when not strictly of inorganic origin. We almost invariably find beds of limestone to contain siliceous fragments or concretions, more or less irregular in form and disposition. Thus we have the menilite of the Paris tertiary limestones, the flints of the chalk formation and the chert of the carboniferous limestone. In some, probably in all, of these cases organic agency has been involved, though to what extent it would often be difficult to say.

I proceed to notice the various formations in the descending order with reference to the microscopic organisms they contain.

Bischof mentions a diatomaceous clay amongst the deposits lying under the town of Amsterdam, at a depth of 138 feet. It is 8 feet in thickness and contains the siliceous shells of innumerable organisms amounting to $\frac{1}{3}$ or $\frac{1}{2}$ its entire mass. It also contains the remains of plants.

The town of Richmond, Virginia, is built on barren siliceous strata of marine origin and tertiary age. The strata are twenty feet in thickness, composed chiefly of infusorial flint-shells, including the well-known and beautiful microscopic objects Actinocyclus and Coscinodiscus.

In 1836, portions of the stone called "tripoli" or "polir-"schiefer" (polishing-slate) were microscopically examined by Ehrenberg, who discovered it to be wholly composed of the siliceous shells of infusoria and chiefly of an extinct species of Gallionella. At Bilin, in Bohemia, there is a single stratum of polierschiefer, not less than fourteen feet thick, forming the upper layer of a hill, in every cubic inch of which there are forty-one thousand millions of this one species. This mineral likewise contains shells of Navicula, Bacillaria,

Actinocyclus and other siliceous organisms. The lower part of the stratum consists of the shells compacted together without any visible cement; in the upper masses the shells are cemented together and filled by amorphous siliceous matter possibly formed out of dissolved shells. At Egea, in Bohemia, there is a stratum of two miles in length and averaging twenty-eight feet in thickness, of which the uppermost ten feet are composed wholly of the siliceous shells of infusoria, including the beautiful Campylodiscus.

In the middle Eocene period we have limestones of vast extent almost entirely made up of Nummulites which, though not microscopic objects, have a structure which can only be investigated by the microscope, which shews them to belong to the Foraminifera. The nummulite limestones are found in Southern Europe, in Northern Africa, in India and China. They also occur in Jamaica and over vast areas of North America. They were evidently sedentary organisms; and, in the large thin species, one side is moulded to the inequalities of the sea-bed on which it grew. The summits of some of the Alps, such as the Dent du Midi and Diableretz, are formed of these beds; and the same rock forms the stone of which the Egyptian pyramids are built.

The mud of the Levant has been found to contain twenty-six species of Diatoms and eight species of Foraminifera, along with sponge spiculæ and fragments of Echinoderms and molluscs. The *Calcaire Grossier* of the Paris basin strongly resembles Levant mud in character. It contains countless numbers of Foraminifers; it forms a good building stone; and it has therefore been remarked that we may say the capital of France is almost entirely constructed of these minute shells.

The tertiary marls of Barbadoes have furnished an almost innumerable variety of shells of Polycystina. Their exquisite forms excite our admiration in the highest degree. Mr.

Stoddart says he has procured Polycystins from this earth at the rate of more than ten millions per avoirdupois pound.

The *Chalk* formation is remarkable for its flint nodules containing the remains of sponges, chiefly their spiculæ, along with other siliceous bodies, as the valves of Diatoms. The chalk itself is composed of the shells of Foraminifera, of other minute calcareous organisms and of bodies called crystalloids that probably are of inorganic origin.

The green sands of the Cretaceous formation and, indeed, of all formations from the Tertiary to the Silurian period contain casts of the minute shells of Foraminifera and Mollusca. Many of the cretaceous Foraminifers contain a brown colouring matter, which remains after the shell has been dissolved with weak acid and which has been regarded as the remains of the organic substance which once filled the shell.

In the Oolitic period we find that, in limestones having the character from which the formation derives its name, the globular calcareous grains of which the rock is composed are generally formed of a number of concentric layers of carbonate of lime incrusting foraminiferous shells. Near Bristol are two beds of this period composed of shell debris, Entomostraca, coral and Echinoderms. In many places the shell partings are covered with Cytheridæ and Estheridæ. The slabs of Oolite at Bath, Minchinhampton and Dundry afford perfect specimens of minute forms.

The Carboniferous limestone formation has in places furnished remarkable results. Thus, in Russia there is limestone of this period varying in thickness from 15 inches to 5 feet, almost entirely composed of foraminiferous shells of the genus Fusulina. Amongst the beds at Clifton belonging to the same formation Mr. Stoddart discovered one twelve feet thick, every pound by weight of which contains more than two millions of perfect Microzoa, Cytheridæ, Gasteropods and very beautiful cylindriform Polyzoa, the latter being so perfectly preserved as to show the cells and thin apertures.

The Silurian rocks are not without Foraminifera, which we thus see to have run through all the formations with which we are well acquainted. In hard limestones and marbles they can be detected in polished sections, and in thin slices laid on glass.

Dr. M. C. White has examined various specimens of the hornstone nodules found in the Devonian and Silurian rocks of New York, and has discovered abundant organisms referable to the Desmidiaceæ, besides a few Diatomaceæ, numerous spicula of sponges and also fragments of the teeth of Gasteropods. Among the Desmids there is a large variety of forms of Xanthidia supposed to be the Sporangia of Desmids [to these the same remarks will apply as to the Xanthidia of flints], besides an occasional duplicated Desmid, (?) also lines of cells, some of which appear to be sparingly branched.

Below the Silurian system microscopic examination does not appear to have been extended.

With regard to the range in geological time through which various organisms extended, it has been remarked that the lower we descend in the scale of organization the less is the liability to change or extinction which we find to exist. Species of *Bacillaria* still exist which were in being at the period of the deposition of the chalk. Existing species of Diatomaceæ have been detected as low down as the Oolite. Ehrenberg has discovered more than twenty species of siliceous-shelled Infusoria fossil in the chalk and chalk marls, which are indentical in species with some now living in the bed of the Baltic.

In Foraminifera most of the fossil genera and even some of the species pass through many formations; indeed, if correctly observed, the existing forms are the oldest known living organisms. *Dentalina communis, Orbitolites complanatus, Rosalina italica* and *Rotalina globulosa,* all living species, are said to be found in the chalk; *Rotalina umbilicata*

ranges to the gault; and *Webbina rugosa* is common to the upper lias, the chalk and the present sea. There is, however, a source of error in this case which requires to be noticed. Fossil shells of Foraminifera are set free by the disintegration of sea cliffs and mixed with recent shells on every beach.

I proceed to notice in the next place, the evidence which the microscope has contributed in the study of the *lithological* character of rocks. In this branch of the subject I have little to report—it is as yet a field almost entirely unworked. I will briefly refer to Mr. Sorby's observations on the microscopic structure of crystals, in which he shews that it is possible to arrive at some knowledge of the temperature and depth at which the crystalline particles of granite and other igneous rocks were formed. Crystals formed from warm fluid solutions are often full of cavities which contain some of the fluid in which they were formed; but crystals formed in substances rendered fluid by fusion, contain cavities in which is some of the fused matter now become solid stone together with vacuities, the relative size of which enables us to calculate the amount of heat requisite to melt and expand the contained stone or glass so as to fill up the whole cavity. Mr. Sorby applies his principles to the examination of many igneous rocks, lavas, traps and granites, and proves from them the igneous origin of all, with the remarkable result that the fluidity of the more superficial lavas and traps was more purely igneous than that of the deeper seated traps and granites. The blocks ejected from Vesuvius during eruption contain water, while the lavas do not; and the crystals of the Cornish elvans and the Cornish and Scotch granites contain both fluid and stone cavities, proving the presence of water and perhaps also of gas, as well as the existence of great heat. He says that in some coarse granites it is impossible to draw a line between them and veins, in which crystals of felspar,

mica and quartz seem to have been formed from solutions without any actual fusion.

In the month of October, 1862, M. des Cloizeaux gave to the Académie des Sciences, Paris, the results of certain experiments conducted by means of the microscope on some constituents of igneous rocks; chiefly varieties of felspar. He subjected minute specimens to the heat of a jet of gas from a blowpipe, and observed the changes in their optic axes at various temperatures by means of a polariscope. He found that with some varieties permanent modifications were produced by the action of heat, if sufficiently intense or sufficiently long-continued. His conclusions from the data he obtained are "in opposition to the hypothesis which "admits the necessity for excessive degrees of heat, to explain "the formation of crystalline rocks where orthose and quartz "predominate."

Dr. Carpenter was requested by Mr. Charles Darwin nearly twenty years since to examine into the composition of the extensive calcareous deposit which covers the surface of the Pampas region of South America and to compare it with that of the calcareous tufa still in process of formation along the coast of Chili. He was able to state that their constituents were in all probability essentially the same, notwithstanding the difference in their mode of aggregation. For the Chilian tufa is obviously composed in great part of fragments of shells, distinguishable by the naked eye; the dense matrix in which these are imbedded is chiefly made up of minuter fragments, only distinguishable as such by the microscope; while through the midst of these is diffused an aggregation of amorphous particles that present every appearance of having originated in the yet finer reduction of the same shells, either by attrition or by decomposition. In the Pampas deposit, on the other hand, the principal part was found to be composed of amorphous particles, so similar in aspect to those of the Chilian

rock that their identity could scarcely be doubted; and, scattered at intervals through these, were particles of shell distinctly recognizable by the microscope, though invisible to the naked eye. Thus, although the evidence afforded by the larger fragments of shell was altogether wanting in the Pampas deposit, it could not be doubted that the materials of both were the same, those of the Pampean formation having been subjected to greater comminution than those of the Chilian; and this view served to confirm, whilst it was itself confirmed by, the idea entertained as most probable on other grounds by Mr. Darwin, that the Pampean formation had slowly accumulated at the mouth of the former estuary of the Plata and in the sea adjoining it. A similar line of enquiry has been of late systematically pursued by Mr. R. C. Sorby, who has applied himself to the microscopic study of the composition of fresh-water marls and limestones, by ascertaining the characters and appearances of the minute particles into which shells resolve themselves by decay, and by estimating the relative proportions of the organic and inorganic ingredients of a rock, by delineating on a paper, (by means of the camera lucida), the outlines of the particles visible in their sections, then cutting them out and weighing the figures of each kind. (Carpenter on the "Microscope."—Quarterly Journal of Geology.)

I have thus briefly considered the evidence furnished by the microscope in the geological examination of rocks; and, although this mode of enquiry is comparatively of very recent origin, it will be observed that even now it has produced results of the highest importance. It has invested many rocks and many geological formations with an interest they did not previously possess; and it has thrown very considerable light upon the phenomena of nature as they presented themselves in past ages of the world's history.

But it will be no less clearly observed that as yet we are

only upon the threshold of this description of scientific enquiry—and the steps which have been hitherto taken have indicated that the area still to be explored is that of a vast continent, upon the shores of which we have but just set our feet. I may be permitted to point out, therefore, in the next place, a few of the points which require furthur examination by the employment of the means upon which I have been dilating.

And first, we are in want of a systematic description of fossil microzoa. It is true that the organisms found in isolated deposits, such as those of Barbadoes, Virginia and other places, have been examined and described; but this by no means completes our knowledge either of the organisms themselves or of the classes to which they belong, or of the rocks in which they occur. The information which has thus been gained, and which will be gained in the same manner, requires systematizing and arranging. Dr. Carpenter's "Introduction to the study of the Foraminifera" is an example of what may be done by a patient study of one particular class of organisms; but even here our knowledge cannot be considered as at all complete so long as we are so little acquainted with the microscopic contents of the palæozoic and older secondary formations. We require, then, a scientific classification of microscopic organisms; whether, as in the case of the Diatoms and the Foraminifers, they belong to classes of which most of the members are minute; or whether, as with certain Gasteropods, they are microscopic genera of classes which in the main consist of individuals of larger size.

One of the phenomena most interesting to the student of nature is the succession of life in time—the gradual but constant change in the species of living beings peopling the earth through the countless ages of which the researches of geology have furnished evidence; and one of the problems which have

caused most discussion, and which require the most profound reflection and patient investigation, is that which endeavours to account for this change. Hitherto the question has been studied almost exclusively with reference to organisms not microscopic. But just as the study of recent microzoa has thrown light upon the phenomena of life in the higher animals, which could not otherwise have been obtained; so it may well be surmised that the examination of the fossil microzoa of successive geological ages will lend very considerable assistance in the elucidation of this most interesting and, at present, most unsettled problem.

It is obvious that, before studying the succession of microscopic life in time, it is required to have a trustworthy list of organisms found in the various strata. The compilation of such a catalogue will again necessitate the complete examination of each formation, and especially of those in which no such examination has as yet been made. The ground yet to be explored is immense. So far, the limestones have yielded the most promising results; but, with few exceptions, it is only the limestones of comparatively recent formations that have been examined microscopically. We may hope for results interesting in the highest degree from such an examination of limestones of Silurian age—as previously mentioned, they have already furnished organisms. Or, to go still farther back in the world's history, the oldest rocks that have hitherto furnished fossils are those of the Cambrian age. So far, these fossils are very scanty. But in formations still older, the Laurentian of America, there are bands of limestone; and it has already been shown as highly probable that all limestones have been formed by organic agency, often by microscopic beings.

But other beds besides those which are calcareous will doubtless yield evidence of life on examination. Many shales, from their carbonaceous character and plant remains, have

evidently been deposited near to land possibly under conditions not far removed from marshy or boggy—conditions highly favourable to the growth of microscopic organisms. The same remark holds with even greater force of beds formed mainly of carbonaceous material, as lignite, coal and cannel. In connexion with beds of peat we often find deposits of infusorial remains; it is in my opinion extremely probable that similar remains will be found along with coal and other varieties of fossilized vegetable matter.

In the examination of *rock materials* the ground has scarcely been broken. Yet the precise manner in which sediment has been collected, deposited and consolidated, the various sources from which it has been derived, the materials which have been subsequently added and the changes to which it has been subject since its deposition, changes which may be purely physical, or chemical, or organic, or a combination of these, cannot well be discovered or understood without constant reference to the microscope. On this and the preceding subjects Mr. T. Rupert Jones makes the following remarks :—"The careful microscopical examination of a "good series of successive deposits cannot but be useful both "to the geologist and palæontologist. The conditions of "deposit will be elucidated by the proportions of fine and "coarse materials in the beds, especially if these be traced "along a considerable tract by the examination of many "samples of the deposit through its variations from clay "to sand (or vice versâ), or in its changes from an argil-"laceous or arenaceous to a calcareous condition. * * * "Except by careful separation in water and patient sorting and "picking, the minute shells and other fosils cannot be obtained "in anything like a fair average; and year by year the Fora-"minifera, Entomostraca, Bryozoa and the small fry of the "mollusca are becoming more valuable as leading characters "of strata, as our knowledge of these microzoa in the recent

" and fossil state advances. Such researches as these made " on any series of deposits, whether British or foreign, must " be of use, either for the improvement and correction of " observations already made and published, or for the ground- " work of future descriptions of strata and their fossils."

Special attention might be paid with advantage to certain beds of exceptional origin. Thus the materials composing the tertiary " drift " are within the reach of every one. It would be interesting to know whether or not it maintained the same general microscopic character over the whole of the immense area which it covers. In the same way the breccia of the Permian formation may give some indication which will throw light upon its supposed glacial origin.

The origin of flint in chalk and of corresponding silicious masses in other rocks is not by any means cleared up. Many of the supposed organisms found in agate and attributed to sponges are by some microscopists considered doubtful. (See the *Micrographic Dictionary*.) Much more is wanted in our knowledge of these singular masses of silica.

The substance Cannel, so different from coal in structure, so similar to it in composition, has received but little attention. Nothing is known regarding its formation; and little, probably, will be discovered, until it is carefully examined by the help of the microscope. The vegetable origin of the diamond was partly inferred from the structure of its undisturbed ash, which under the microscope presented a regularly arranged network of silicious fibres. I would suggest that this instance furnishes an indication of a method which may give valuable information when applied to the examination of the varieties of fossil fuel.

In the case of igneous rocks I must content myself with observing that the experiments of Mr. Sorby and of M. des Cloizeaux are highly interesting, from the important results which we see them to have obtained at the outset of their

journey into this hitherto untrodden country. And those of the latter observer are also useful as indicating another mode in which may be made available that powerful aid to the microscopist, polarized light.

Lastly, the structure of mineral veins and the nature of the deposits contained in them will, probably, on microscopical examination, enable geologists to make a nearer approach than they have hitherto done to a definite and trustworthy idea of their mode of formation and the laws governing them and their contents. If so, the practical advantages of such an investigation will be very great.

Such is a very brief and imperfect sketch of what man has done and of what man may expect to do with the help of the microscope in furthering the study of the science of geology. It will have been seen what a small proportion the knowledge hitherto obtained by this means bears to that which we may yet hope to gain; and we have incentives to such a pursuit in the numberless points of interest which have already shewn themselves, in the vast area still unworked and in the certainty that we shall, by such investigations, be enabled to throw light upon some of the grandest truths which it is the privilege of man to discover. In following out the object which every true student of science bears constantly in view we have the unalloyed satisfaction of assisting in the great work which has engaged so many master minds; and we shall feel that we are members of one great family whose distinction it is to combat error and, with a perseverance unaffected by personal considerations and an energy borne up by the consciousness of a pure intention and a holy ambition, to labour on in the great cause of TRUTH.

EVERY-DAY LIFE OF A COUNTRY GENTLEMAN OF CHESHIRE IN THE 17TH CENTURY:

AS SHEWN IN THE PRIVATE EXPENDITURE JOURNAL OF COLONEL HENRY BRADSHAW, OF MARPLE AND WYBERSLEIGH.

By A. Craig Gibson, F.S.A.

(READ 8TH JANUARY, 1863.)

AMONGST the letters and other documents relating to, or written by, the Lord President Bradshaw which, last session,* I had the honour of bringing under the notice of this society, were included a few, especially connected with the elder brother of that dignitary, Colonel Henry Bradshaw, of Marple Hall and Wybersleigh, in the parish of Stockport and county of Chester.

Of these the most important, as well as the most interesting, is Colonel Bradshaw's Journal of Expenditure, extending over more than seven years, namely, from the beginning of 1637 to the middle of 1644. The little volume in question has probably contained the diary of more years than these originally, for it exhibits signs of having been considerably mutilated; and it is to an examination and analysis of what remains that our attention, on the present occasion, will be mainly directed. It may add to the interest of such examination to take first a glance at the career of the gentleman who has thus incidentally left to us so minute and suggestive a record of his daily life; for though it does not, like an ordinary diary, directly chronicle events, the entry of every sum ex-

---

* Vol. II, N.S., p. 41.

pended, even the smallest, and the reason for, or object of, all such expenditure, however trivial in amount or purpose, throws very considerable light upon the mode of life and pursuits of country gentlemen of limited means in the diarist's station, period and county.

The Bradshaws of Marple are said, by most authorities, to have been a branch of the ancient family of Bradshaw of Bradshaw in Lancashire; however this may be, there were also Bradshaws of Bradshaw in Derbyshire, from whom the subject of this notice was more immediately descended,* his great grandfather having been the head of the Derbyshire house, and his grandfather having purchased Marple Hall and lands at Marple and Wybersleigh of Sir Edward Stanley, of Thong. It would appear that, at the period of this acquisition, the Cheshire Bradshaws were not recognised as holding squirearchical rank amongst the always proud landed gentry of their county; for in the deed of conveyance (existing in 1817) the purchaser of Marple Hall is styled "Henry Bradshawe, *yeoman*." The son of this yeoman, so called, resided at Wybersleigh Hall, "an ancient "habitation no way remarkable," which either was not at that time, or subsequently ceased to be, the property of the family; as, according to a marriage contract preserved at Marple at the time already named, and dated 30th September 6 Car. (1630), that messuage was acquired by the third Henry Bradshaw through his marriage with Mary, daughter of Barnard Wells of Hope, County of Derby; and he resided there till his father's death in 1654, when he removed to Marple Hall, the family seat. By this his first wife, Colonel Henry Bradshaw had a son, also named Henry who, after his father's death, acquired by purchase Bradshaw Hall, near Bolton, the seat of the Lancashire Bradshaws. He had also a daughter, Katharine, whose name is given incorrectly by Ormerod as Anne. Of this inaccuracy there is ample proof.

* Ormerod's Cheshire.

Amongst these papers is a letter from Bradshaw's brother-in-law, Robert Eyre, which, as bearing upon his family history, I transcribe.

Sir,

I heave sent you a true coppie of my late mother Wells her will, and of all I know concerning it. I desire yo^{r} excuse, for had not y^{e} y^{n} some other urgent buysiness taken off my man from coppieing it you had received it before now. I hope y^{r} selfe and my syster your lady are in good health. My wyfe p'sents her due respects to you both and soe dothe y^{r} truely loveing brother,

ROBERT EYRE.

High Low, March 2d., 1657.

Then follows a postscript anticipating Bradshaw's dissatisfaction with his mother-in-law's distribution of her property—

Sir, if any difference shall hapne to any amongst us, for want of any true understanding one another, at any of y^{r} conveniences I shall be very ready to give you and yo^{r} children satisfaction, and to deale uprightly at sight of yo^{rself} and any wyse, contionable gentleman. This I thought fitt to intimate that all misthoughts may be prevented if possible, and all reall affections preserved. Y^{s} R. E.

Addressed "for his ever honored brother,
Henry Bradshaw, Esq., at Marple theis,"
and endorsed in Bradshaw's hand,
"My mother Wells' pretended will is here enclosed."

The copy of Mrs. Wells's will, so enclosed, is also preserved, and is curious from the number of religious reflections and allusions to points of doctrine of a Calvinistic character introduced into it, indicating that the testatrix belonged to the then dominant party. She bequeaths to her "sonne-"in-law, Henry Bradshaw, the some of twenty pounds, and to "Anne, his *now* wife the some of ffive pounds;" and, farther

down, unto her "grandchild, *Mr.* Henry Bradshaw, the some "of twenty pounds;" and again, after one or two other bequests, "unto *Katherine* Bradshaw my grandchild the "some of one hundred pounds." This legacy is annulled in a codicil, on the ground that it has been paid during the lifetime of the testratrix. The document is endorsed by Henry Bradshaw thus—"5° Maii, 57. The inclosed is s'd "to be a true copy of the last will of my mother Wells: dated "the 18th day of 9ber, 1656. Togithir also with a codicill, "s'd to be hers, and dated 22d Januarii, 1657." It is, therefore, evident that Mr. Eyre's fears were not groundless.

These two, Henry and Katharine, were probably all the children Colonel Bradshaw had by his first wife, though he had a large family by his second, a daughter of George Bowdon of Bowdon.

Were further proof required of Ormerod's error as to the name of this eldest daughter, it may be found in the diary, where payments for articles of attire, books, board, education &c., for Kat and for Harrie are frequent entries. The rest of his eleven children were, probably, at the date of the diary, either unborn or too young to require special outlay.

After leading the quiet life of a country gentleman of small income for upwards of forty years, for his age went with that of the century, Henry Bradshaw became an active participator in the disturbed political affairs of his time. In the earlier years of his journal we find entries of payments of "ship-"money," "my share of the contribution to Ireland," "for "peticion to the parliament," "for my share of subsidies" &c.; while in its later records we find disbursements for military accoutrements, ammunition, matches &c., with allowances of money and of drink to "my souldiers," gratuities to the guard or sentries at different parts of his neighbourhood, payment of messengers to Sir W. B. (Sir William Brereton) and many other indications that the hitherto quiet tenor of his

life was broken never to be restored, as it turned out, so long as he lived.

We have, with these papers, a curious relic of the early part of his military career, styled—"The Accompt "of Major Henry Bradshaw," and stating that "Hee was capt "of a company of foote souldiers in the regiment of Colonell "Rob^{t} Duckenfield, in actuall service for the Parliament from "the 13th day of May 1643 to the tenth day of March the "same yeare,* beinge 301 dayes.

"Hee was Serjeant Maior to the foresaid regiment from the "sayd tenth of March (by vertue of a Comission from the "late fferdinando Lord ffairfax) vntill the third day of "ffebruary 1645, being 695 dayes and was in both these "comaunds in actuall service.

	£	s.	d.
"And towards pay due for the same hath rec^{d} "from Sr Will. Brereton or by his ord^{r} out "of the 12000$^{£}$ ordred for Cheshire the sume "of	42	0	0
"from and by order of his Colonell.....	2	10	0
"And lest any mistake should happen though "hee knoweth of none, hee is content to cast in	5	10	0
"Totall recd.....	50	00	00

"4 ° Decembr, 1649. "(Signed) Hen^{r}. Bradshawe.

"These Accompts delived upon
"oath before vs,
"Edmund Swetengam,
"Charles Whichcote,
"John Millington.

"The truth of this Accompt is vpon oath vouched,
"Sig. Will. H. Higginbothom,
"William Sydbothom."

* The year beginning in March.

From this statement it would appear that, whatever might be the inducement to serve in the Parliamentarian army, it could hardly be the amount of pay, for we see that an officer of good family was satisfied with the pittance of £50 for nearly three years of active service—more than two thirds of the time as major, the remainder as captain. After leaving Dukinfield's regiment he for some time held the commission of lieutenant-colonel in Ashton's regiment of foot. He afterwards, with the rank of colonel, commanded the Macclesfield militia, at the head of which he was wounded in the battle of Worcester, the crowning disaster to the royal cause. His wound, however, does not seem to have been serious, for, in a week or two afterwards, he, unfortunately for himself and his memory, took his seat as a prominent member of the court-martial that tried and condemned the gallant and loyal Earl of Derby, at Chester; but this, according to his own account, he did unwillingly.

During the non-fighting portion of Cromwell's reign, Colonel Bradshaw led an active life as a county magistrate and commissioner for the sequestration of royalist property under the Parliament. In connection with the former of these offices we have here an original letter addressed to him by Sir Thomas Stanley, of Alderley.

S. E.

I was in hopes to have heard of a Quarter Sessions before this tyme, but neather hearinge nor knowinge when yt will bee, and my occasions commanding me towards London this day, have thought fitt to commend the enclosed to yo^r^ further consideration ;* and to intreat, if yt happen a sessions bee called before my return that you will please then to acquaint the gent. therewith and what they and you think fit to be done therein I will readily joyne with

* The enclosed not preserved.

ye—and also act accordingly dureinge my stay in London, accordinge to the directions and determinacions of them and you therein; If noe sessions happen to be before my returne, then I shall most willingly meet you about the same. In the meane tyme, I p'sent my kinde respects and love to you and remayne

Yo^r assured friend to love and serve you,

Alderley, 31° Jan. 1652. THOS. STANLEY.

Amongst the MSS. preserved by the Rev. J. Watson is a letter from Bradshaw to Colonel Croxton, then governor of Chester, which goes to prove that, in his capacity of magistrate, the former was not above listening to and acting upon information of a rather absurd character, and also throws curious light upon the state of Society at that time. The letter is dated Marple 30° January, 1657, and runs thus—

Sir,—I have received informacion on a single oath against one William Cr(es?)well, of Sutton, near Macclesfield, Esq., who hath a wild stoned horse, which he calleth Stoned Robin, which he saith he keepeth to be the death of the Lord Protector. He alsoe saith he hath some armes in his house, and that he hopeth the king will come soon, and then he will have more armes and horses for him. I sent out my warrant for him last weeke, but I heare the constables cannot, or dare not take him, for I am told that he lives like an outlawe, and is a notorious enemy.

Your real friend and servant,

H. B.

As a sequestrator he appears to have held a conspicuous position, for in the correspondence of John Bradshaw, published in the last volume of this society's "Transactions," it may be remembered there is a letter desiring the Lord President's intercession with his brother—whom, the writer says, they conceive to be "one of the chiefest in authority" amongst the sequestrators—in favour of a reduced lady with a claim on

one of the forfeited estates in Cheshire ; and it is pleasant to know the appeal was successful.

In these capacities, and in superintending the organization and maintenance of the local militia, Henry Bradshaw appears to have been actively occupied up to the period of the Restoration, when he was called upon to answer for the last and least commendable act of his military life, for in July, 1660, he, with the other surviving members of the court that condemned Lord Derby, was summoned, under the petition of the widowed countess, to appear before the privilege committtee of the House of Lords ; it being held that for commoners to condemn a peer to death was a breach of privilege. Bradshaw, however, escaped with a month's detention in custody, on paying fees and finding bail. It is probable that the contemptible monarch who refused to ratify the act of both houses of parliament ordering the restoration of the Derby estates to the family of the devoted nobleman who sacrificed all to his loyalty did not care to have those punished who, in violation of the usages of honourable warfare, condemned that nobleman to death.

According to the already-quoted Rev. John Watson, Rector of Stockport, who, about the middle of last century, collected, but, so far as I know, never published, a large amount of documentary information respecting this family, * Colonel Bradshaw's defence consisted of a somewhat abject appeal *ad misericordiam* of the government he had so long opposed. Otherwise it is so interesting that I need make no apology for abstracting the substance of it from Ormerod, who had it from the source mentioned above.

Bradshaw said, in effect, that it was by command of his general, Cromwell, that he was present at the said court-martial—that he was not constantly present at the Earl's trial

---

* See Ormerod's Cheshire.

and did not sign any warrant for his execution. On the contrary, that he did all in his power towards saving his life and, at the instance of the succeeding earl, he presented a petition with that object to Colonel Mackworth, president of the court, and was present at the final sitting of the court solely to offer and press that petition—that he was sent for by the earl after his condemnation and, at his desire, wrote to his brother, John Bradshaw, the President of the Council of State, to use his utmost efforts to save the earl's life—that he never had anything of the said earl's—that he was a poor man, in debt, with a small estate and a poor wife and eleven children. Wherefore, intending for the future so to demean himself as became an obedient subject, he humbly craved the benefit of his Majesty's most gracious pardon, and their lordships' favourable construction of the premises, and that his errors might be imputed to his much-lamented ignorance and mistake.

Mr. Watson further says that Thomas Elcocke, of Stockport, a servant of Henry Bradshaw, deposed that his master informed him that, through his intercession with his brother, the Lord President, Lord Derby's pardon was actually granted and came into the hands of Colonel Dukinfield. Possibly we may believe that a daring and thorough-going partizan, like Dukinfield, might suppress the earl's pardon; but Elcocke's statement is invalidated by his attributing to the unfortunate nobleman a proposal of conditions that would belie the whole of his career.

Colonel Bradshaw survived his liberation only seven months, his life being shortened, probably, by anxiety and chagrin; and he was buried at Stockport, on the 15th of March, 1661.

Amongst the papers entrusted to me I find a copy of elegiac verses on Colonel Bradshaw's death, which I think worth transcribing, as a curious specimen of the poetical taste of his time. It abounds in odd conceits and overstrained

phraseology and has most likely been written and presented to the family by some very learned neighbour, for it is fairly copied out, within broad mourning borders, and illustrated with curious marginal notes in Greek and Latin.

AN ELEGIE

Upon the much lamented death of Henery Bradshaw, of Marple, Esquire, who departed this life March the 11, Anno Dom. 1661.

What time—s from death exempt, who is't can say,
I shall outlive one minute of this day:
What place is safe: whitherto may wee flee,
fro. ...eager death's arrest; the Pallace hee
of Prin...e doth invade; nor humaine art
can rayse a ...ire to repell his dart,
nor youth, nor ...rength, nor wealth, nor physic may
this dustie ta... ...le from decay
p^eserve; where ere wee shelter, without doubt,
this dead ey'd Cockatrice will find us out;
wise men, as well as fools, must tast wee see
the bitter cup (blest soule) too true in thee;
too true s^d I; pardon my zeale distract
my muse, my senses, and my reason wrackt,
wel-nigh exil'd; I think for to compute,
the loss of loosinge thee, but cannot doo't;
lette speech supp^essing sighs, let pearl dropt tears
that glide from blubbered eyes of reliq^t dears
dear wife, deare children, ffriends, and neighbours deare
speake forthe thy worth, their want, the panic feare
resultinge from thy dismall sad ablation,
whence groans, and sobs, and tears are most in fashion
Ile cease therefore to write, with others I
will weepe forth this sad funeral elegie;
and though hee's gone, I wish and hope to see
his virtues radiant, in his progenie.

ffr: L.*

With this remarkable production I close my cursory notice of the public acts and life of this respectable Puritan officer and magistrate. The accidentally preserved little volume,

* Most likely Francis Legh of Lyme, a contemporary and friend of Bradshaw. In the Journal we often find entries of gratuities to messengers bringing venison from Lyme.

containing an evidently conscientious account of his most trivial as well as of his most important daily expenses, affords a curious insight into the everyday and domestic life of men of his station at a very interesting period of our history.

In the first place judging by the amount of his expenditure, it would appear that Henry Bradshaw's income must have been much smaller than we should suppose requisite to support a person of his position. His disbursements of every sort for the whole six years, 1637 to 1642, including both, amount to £814; but in this sum are comprised payments of borrowed money, and interest of money still owing, to the amount of £413, or more than half the gross sum, so that his annual outlay during those six years averaged about £66, varying, however, between £90 spent in 1637 and £54 in 1640. Even for those days, when all the necessaries of life were so much below the prices of our times, as represented by the money they cost, this must be regarded as a surprisingly low rate of expenditure, and shews that at *that* period of his life, the plea of poverty that he entered amongst others before the Lords' Committee, several years later, was in all probability true, although the occurrence of his father's decease must have increased his income considerably. And the truthfulness of another plea on the same occasion, viz., that he was in debt, may be inferred from the frequent recurrence of such entries as these :—

Paid Mr Watson the remainder of such monies as I owed my Brother Jo :.....	£2	0	0
Paid Tho : Lowe in Stockport which I owed him	20	0	4
P^{d} this day to Kath : Hudson in p^{te} of £50 w^{h} I hired of her for a yeare now past.....	24	0	0
And spent at Disley vane 2/6 and p^{d} to Mr. Joddrell for hire of £50 for a year now past.....	4	2	6

so that it would seem he was in the habit of paying interest on those loans at the rate of eight per cent.

The interpolation in this last entry of money spent *vane* at Disley reminds me of what was the heaviest cause of expense to Colonel Bradshaw. All through his journal, but most frequently in the early years, we find such items as these jostling each other.

Spent at Manchester and Stockport on my Bro^{r} Wells and his man for meate drinke and wyne	£0	10	0
Spent stolide that day nescio quid.....	0	0	0
Spent vane apud Bridge-end and Stockport on ff. L.* et sociis suis circa.....	0	6	0
Spent at Stockport stolide circa.....	0	8	0
Spent at Glossop ffaire circa.....	0	3	0

In fact, these entries are so numerous, that in 1637, money spent in the manner thus indicated amounts to £12, in 1640 to £8, and to £4 6s. in 1641, averaging about one-eighth part of his nett expenditure.

He has evidently been of a very convivial turn, and has spent a good deal of his time, before he entered upon his military career, in riding about the country and engaging in drinking bouts with any jolly companion he might meet. No doubt this was very much the custom amongst men of his class down to a time much later than his ; but it rather startles us to find that a somewhat distinguished officer in the Puritan army was so much of a boon companion as we have his own word for concluding this gentleman to have been. It is equally evident, however, that he generally repented such indulgences with great sincerity ; and that though very apt to fall again, whenever tempted, he rarely failed to chronicle his folly faithfully in this journal, and to punish his lapses and relapses by applying to each such occasion a few stinging

* The initials of the elegy writer.

Latin adverbs, as *vane*, *stolide* and, when he thought his conduct rather more reprehensible than usual, *impie;* but he only used this last severe word when the affair had gone so far as not to admit of his remembering or reckoning the cost, and the amount had to be entered "nescio quid, £0 0 0"; or, if it admitted of a guess, "nescio quid certe, sed ut puto," such a sum; or thus, "Spent hodie apud Capella in le ffrith, "certe nescio quid sed impie et vane £0 0 0."

At Disley, near to his residence, we are led to infer there was a public house, kept by one William Leather; and there, more frequently than elsewhere, he would spend the money the record of which produced such rigorous self-rebuke.

To counterbalance this evil habit, which was perhaps the fault of his times rather than his own, Colonel Bradshaw's little book of disbursements shews that his heart was open to charity and that his hand was always ready to give effect to it. Even the nature of some of his charities is suggestive of the character of the time; thus we find the entry of a small contribution towards the relief of "a poore minister in prison," and an alms "given to one Talbot and his Boy, a p'tended "souldier." We also find that, considering his means, he was very liberal in bestowing gratuities upon servants, messengers and other persons of inferior grade who were brought into contact with him; and that it was the fashion then to bestow money presents upon people of a higher rank than these on certain interesting occasions, as for instances—

"Given to younge Mrs. Davenport and her Child..... ..... £0 10 0
"Given to my sister Eyre's Child..... 1 0 0
"To the midwife, nurse and servants there 0 3 6
"Given to my Cosyn Geo. Bradshaw's wief and child 0 10 0
"Given to Mrs Warren at her child's christening 10^{s} and y^{e} nurse 2^{s} ..... 0 12 0"

The first entry for the year 1638 is singular—

"ffor 5 p^{r} of gloves ffor Rich : Knott and my 4 servants Beeley, Harison, Wright, Bramall..... £0 2 6"

He appears to have been exemplary in his attention to religious ordinances. We find very frequent entries of small sums "given at the Coion table," sometimes at Stockport, sometimes at Marple and at Disley, and almost equally frequent contributions to collections made at these places. Though a leader amongst the dissenters, and the first who signed the Cheshire petition to Parliament to make Presbyterianism the State religion, he paid his Church dues freely, for we find him recording many such payments as—

"My tythe silver £0 10 0

"To Parson Shalcrosse* for Easter rent for our township &c. 2 3 0

"P^{d} to Rob^{t} Swindell p. a mize p. le Church, after 16^{d} le pound..... 0 1 10"

This last entry shews that his residence was rated very low, as was the custom in country parishes at a much later date.

His manner of keeping his accounts evinces some other peculiarities, and prominent amongst these is his habit of lumping in one entry payments very unequal in amount, and very incongruous in object, as these—

"P^{d} to F : W : at Oakes 108$^{£}$ and given 4^{d} to his man and spent on myself and Ned Wright 20^{d} £108 2 0

"Spent at Manchester about 5^{s} to the ostler 3^{d}, for a p^{r} of gloves and thimble p. K.B. 3^{s} and left wth Mary Bowringe ffor H : table till Midsummer last 3$^{£}$ & for 4 threaves straw 1/ 3 9 3

* The Rev. Edmund Shalcross was Rector of Stockport in 1644 and previously.

"P^d to Na: Hegginbo: for a day mowinge
8^d a day plowinge 6^d to Robert Hulme
for a skin of parchment 8^d for Bennett
bootes 8 & to John Sydebottom for
a cow & calfe 3^£ 5^s .... £3 14 10"

Another curious habit evinced in this book is that of introducing a word or two of school boy's Latin here and there, mostly indulged in when the entry was something he was rather ashamed to see recorded in plain English. I have noticed how he stigmatized his drinking bouts. There are also a few entries in which, through the veil of initials and abbreviated Latin, I think we may discover grounds for suspicion that occasional drinking was not the only squire-like habit that Colonel Bradshaw indulged in, as in these—"given "to A. W.*. p. dimidio p. pecc. 1^£," and again, "given to "A. W. p. pecc 1^£ 2^s."

But occasionally he introduces a word or two of Latin when English would answer his purpose quite as well or better, thus, he frequently writes dimid. for half, as "dimid. a yeare," "dimid. a hoop," &c., and uxor for wife, thus—

"Dat uxori 5^s..... £0 5 0
"Given to uxor Geo Ratcliffe for takinge
clubbhead's calfe from her 12 days
before her 40 weeke .... 0 2 0"

We see that no cause of outlay is omitted, however trifling or uncouth, or whatever reason the writer may have had for concealing it; and this habit makes Colonel Bradshaw's journal, as a reflection of his life and character, peculiarly valuable. One of the entries I have quoted contains an item that requires explanation, viz., £3 for "H. table." This occurs every year, generally more than once, with the name "Henry" or "Harrie" in full. It refers to his son's board

* Probably his servant, Ann Wright.

at Macclesfield with a Mr. Mellor, which was paid for at the rate of £6 per annum. Those entries are generally accompanied by a payment at the rate of 10s. per annum to "Harries "Mr. for Schoolinge." The daughter Katharine was also boarded from home at a cost to her father of £5 a year.

These charges naturally bring us to observe the prices of provisions and other necessaries as shewn here. It appears that butcher's meat was so cheap that he never gives the price per lb.; the purchases of that article being always entered as made by the joint or piece. A quarter of veal, we find, cost 1s. 10d., a breast 8d., a loin 10d., a quarter of lamb 1s. 2d., a breast of mutton 7d. Venison—a quarter of doe 1s., half a buck 2s. 6d. to 3s. 4d. The only fish quoted are herrings, of which we find frequent entries, at 3s. the hundred.

In grain and other local produce, we find that wheat was rather dear, 1s. 3d. the peck; barley 8d. per peck, and malt 6s. 8d. the old hoop. "A peck of peason" was 1s. Oats he probably grew, as that grain is never quoted, and there are frequent entries for drying it at 2d. the sack. Turnips were 8d. the hoop; apples, 1s. and 1s. 2d. the peck; hemp was 4s., and wool, 10s. per stone; a load of Namptwich salt was 9s. 6d.; coal, 1s.; and lime, 1s. 8d. per load. In household articles, candles were 4d., 5d. and 6d. the pound; starch, 4d. and 6d.; wax, 1s. Sugar is never mentioned; vinegar, 8d. the quart; pepper, 2d., nutmegs, 5d., the oz.; soap, 1s. the dozen (balls ?); tobacco, 2d. an oz. The only priced entry for wine is one pint of sack, 1s. 10d.

As to wearing apparel, we observe that Col. Bradshaw paid for a good suit of clothes, comprising six yards of "Kentish "cloath," and trimmings, or, as he calls them "furniture," viz., "silke, buttons, fustian and other necessaries to make up my "suite," £4 16s. 2d., with the subsequent addition of 3s. 4d. "ffor a girdle and more silke." For common wear he had a

suit of frieze which cost only £1 13s. 6d.; while the "furni-"ture" alone of his leather doublet cost £2 5s.; so that that article of attire must have been rather handsomely trimmed. "A hatt for myself" was generally 6s.; but an early entry runs thus—"P^{d} to Wm Tailor for a blacke hatt, one of myne, "which cost me circa 8^{s} and more in money 15^{s}"

Broad cloth was 13s. 4d., "flaxen cloath" (linen) 1s. 4d., and Holland 2s. 8d. the yard; while "hemp cloath," what we should now call sacking, but then the ordinary shirting material, was 1s; and "Scottishe Cloath," whatever that might be, was 2s. 6d. per yard. Boots were from 10s. to 12s., shoes about 4s., stockings 7d. to 2s., and gloves from 6d. to 2s. 6d. the pair.

Labour of all kinds was very cheap. Common labourers had 3d. and 4d. a day; masons, wrights, tailors, thatchers, paviours, ploughmen and mowers were paid at the rates of 6d. and 8d. per diem; male servants had £3 a year in wages, and female domestics half that amount. These quotations might be greatly extended, but as the whole of the journal for 1640 is here appended, probably the list given above may be considered sufficient.

Januarii
1640
16° Caroli

6	Given to Ann Wright for a newe yeare's gift	£0	1	0
7	Spent at Wayley and Disley circa.....	0	10	0
	Given to a man ffrom Woddhouse with a l^{re} from A. B.	0	0	6
11–12	Spent at Manchester 6^{d} and given to the ostler 4^{d}	0	0	10
13	Spent at Chappell 3^{s} 6^{d} and given to 2 men 7^{d} ...	0	4	1
14	P^{d} to Rob^{t} Goddard p. the peticion to the parliam^{t}	0	4	0
17 18 19	Spent at Macclesfield and Congleton 4^{s} 4^{d} and given to my brother's 5 servants 3^{s} and to 2 poor folke 3^{d}	0	7	7
	Given to Edw Dooley for goinge with my Boy ...	0	1	0
	and sent to the m^{r}.....	0	2	6

20	Given to the ostler at Manchester 4d spent 4d.....	£0	0	8
	Spent at Stockport 4d given to a messenger from there 4d & to Platt wief of her rent due att last	0	1	0
24	Given to a man from Charles Ashton with beef ...	0	0	4
28	Spent at Chappell-le-frith.....	0	1	6
30	Given att the Co-ion at Disley 4d pd for my dinner			
31	att Wm Leather's and spent 1s 3d	0	1	7
ffeb 1	Given to Snells for an errand to Congleton.....	0	0	9
2	Pd to Thos Beeley for dryinge 3 sacks of oates 6d			
	and for mendinge a wheele to Wm Bower 6d ...	0	1	0
3	Pd to Robt Platt all his wage att p'tinge with him	1	10	0
	Spent at Wm Leather's.....	0	0	6
4	Given to my Cosyn Geo: Brad: wief 10s and in			
	the house 4s 4d	0	14	4
5–6	Spent at Chappell, Wayley and Wm Leather's			
	certe nescio quid sed ut puto circa	0	10	0
7	Pd to Jo: Mason for a lay att 6d the pound.....	0	0	8
8	Given to ffra. Richardson for 2 younge kidds.....	0	0	4
12	Pd for a psalter 1s for 2 halter raynes 1s for a pr of			
	Trayces 8d and given to Beeley 4d	0	3	0
13	Pd old Haslegrove for Bread 2d.....	0	0	2
16	Pd to Thos Steele p. an oxe stirke p. T. Bennett...	1	18	0
19–20	Spent at Manchester 1s given at Blakeley 3s 6d			
	spent again at Manchester 1s 4d and at Eliza			
	Chorton's 2d	0	6	0
	Pd to Wm Tailor sonne p. a hatt for my sonne 3s			
	and for a pr of hosen for him to Riche Birche			
	2s	0	5	0
25	Pd to Geo: Barber wief for fflaxen yarne.....	0	4	6
26	Given yesterday to Snell's wief.....	0	0	6
	Pd to Wm Bower for one week.....	0	0	6
27	Pd to P. Rowbothom for 10 dayes plowinge.....	0	5	0
Mart				
4	Pd to Tho. Chorton for 6 weekes worke	0	6	0
7	Pd to the Co-ion table 3d for my diner and beere 6d			
	and for Bread yesterday 2d	0	0	11
8	to Will Burges	0	0	6
10	Spent at Will Leather's p. diner and ale.....	0	1	6
11	Pd to P. Rowbotham for 10 dais and a halfe	0	5	6
13	Spent on Cosyn Bradshaw's wief and 3 of her			
	sisters their man and myselfe for diner and ale			
	at Disley	0	3	3

		£	s	d
	Given Alice Rowbotham	£0	0	4
16	Spent vane et stolide att Bowden circa	0	3	0
22	Given to Snells 6d and also an errand to Dunham	0	0	9
24 25	Spent at Bridge-end 6d given Robin Smyth 3d and pd for tobacco 2d	0	0	11
28	Spent at Disley vane 2s pd to Besse Bramall the remainder of her wages beinge 1£ 6s	1	8	0
30	Spent at Geo Colliers vane 2s	0	2	0
April				
2	Pd for my man and spent in Manchester vane circa	0	10	0
4	Given att Co-ion table at Stockport 2d.....	0	0	2
6	Spent at Chappell-le-ffrith 4d	0	0	4
7	Pd to Ott. Ward for geldinge my colt at home.....	0	1	0
8	Spent att Cheadle 6d and att Bowdon 2d and att Uctoftes of the Sandie-waye-head 1s 8d	0	2	4
9	Pd yesterday to Wm Burges for killing a swyne 9d and to day for two younge ones 1£ 10s and for 1 doz seeds 10d for a pair of stockings for Harrie and for my chief rent to Mr Warren 1s 8d	1	13	3
10	Pd ffor a pr of stockings ffor Harrie 9d and given to Beeley 4d and pd ffor dryinge 4 sackes of oates 8d	0	1	9
13	Given to a poore woman 2d	0	0	2
15	Pd to Lee Barber for his wief p. 2lb of fflaxen yarne and a halfe att 18d the pound 3s 9d.....	0	3	9
16	Spent at Stockport 4d pd ffor Rats bane 1d given a poore man 1d to the barber 4d and to Beeley Tho : 5d.....	0	1	3
20	Pd ffor 6 yds of garthe webb 1s 6d.....	0	1	6
	and to Wm Richardson wh is yett unwrought ffor 1s 6d	0	1	6
22–23	Spent at Congleton 15d given to the ringers 6d pd for my mare 13d given to the ostler 6d and to my brother's three servants 2s 6d ffor changeing Henrie Eyre to a par. 1s	0	6	10
24	ffor Bread 2d and given to Beeley 6d	0	0	8
	Pd ffor a qr of veale 1s 6d	0	1	6
25	Pd ffor a qr table for my sonn by Geo : Dooley 1£ 10s and ffor mendinge his shoes 6d to George Robinson	1	10	6
26	Pd to Thos Beeley the last pte of his yeares wage	1	0	0
	Spent at Wm Leathers stolide 2s 6d.....	0	2	6

28–29	Spent at Manchester 3^{s} 4^{d} and given to the ostler 9^{d} and for a testament ffor Kat. and a speech 3^{s} 2^{d} and ffor a sampler and 2 minikins 10^{d}.....	£0	8	1
	Spent at Stockport and to the ostler 6^{d}	0	0	6
Maii 4°				
	P^{d} to Nicholas Knott the remaynder and last parte of the 32$^{£}$ which I had of his to keepe, I say paid att this last tyme of payment 3$^{£}$	3	0	0
	P^{d} to Ann Wright on Sunday last in p^{te} of her wage due at Lad : last 5^{s}	0	5	0
5	Given to Uxor Geo : Ratcliffe for takinge Clubb head calfe from her 12 days before her 40 weeke	0	2	0
7	Spent at Stockport 4^{d} given to the poore 2^{d} p^{d} ffor a purse leather 4^{d} Garden seed 1^{d} a p^{r} of shoes for Kat. 1^{s} 9^{d} leather to mend my shoes 1^{s} 5^{d} dimid : hoope of wheate 2^{s} 5^{d} two p^{r} of eare wires 4^{d} and given to Tho Bennett 6^{d} and ffor 2 wodd platters 4^{s} 8^{d}.....	0	12	0
9	Given att Co-ion table att Marple 2^{d}	0	0	2
10	Given to Will Goddard (by money w^{h} his ffather longe hathe owed mee) for a q^{r} service now last past 15/.....	0	15	0
14	Given to Tho Bennett 6^{d} and ffor Bread to Haslegrove 2^{d}.....	0	0	8
15	P^{d} ffor a loyn of veale 10^{d} and given next day 2^{d} to a cobler.....	0	1	0
	ffor dyinge 2 aprons for Kat. 4^{d}	0	0	4
18	P^{d} our Townshipmen for a Church mize	0	1	9
19	Given to my brother's man with a grayhound.....	0	1	0
	and to Snells to take him to Blakeley.....	0	0	3
21	Spent at Stockport p. Wm Leather and Burges circa	0	1	6
	P^{d} ffor a stone of hemp 4^{s} and given to Lyney 4^{d}	0	4	4
	P^{d} for p^{te} of my p^{te} of the two subsidies	0	0	9
24	P^{d} to Joan Oliver ffor 7 weeks service.....	0	3	6
26	P^{d} to Ro^{b} Thornelie ffor 3 days pavinge	0	1	6
	Given to a poore man	0	0	2
28	Spent att Stockport 8^{d} and given to Snells 1^{s}.....	0	1	8
29	P^{d} ffor 3 yards fflaxen cloath to Wm Heginbotham's wiefe	0	4	0
	ffor Bread 2^{d} and a bottle of vinegar 6^{d}	0	0	8
31	P^{d} to Geo Elliot and Tho Sydbotham ffor dimid a yeare of our minister's wages ending Sunday last 5^{s}	0	5	0

June 3	Given to a poore man 2^{d} and spent att Chappell and given to the ostler 3^{s}	£0	3	2
4	Spent att Stockport 1/ and p^{d} ffor 2 y^{ds} of Scottysh cloath 5^{s} and given to Wm Thornelie 2^{d}	0	6	2
5	Spent att Manchester and given to ostler circa	0	2	4
	P^{d} for serge and furniture ffor a suite	2	3	0
	P^{d} for Parl^{t} booke of and for a	0	2	10
	and sixpence to Rob^{t} Hudson and his men and a paire of new shoes w^{h} were too short and for another paire	0	11	6
6	Given to the poore att Co-ion table at Stockport	0	0	2
8	Spent at Altringham 2^{s} 6^{d}	0	2	6
	P^{d} Wm Lynay for 3 weekes service	0	3	0
11	P^{d} Wm Richardson and his man all their wages till nowe and lent him to be paid againe by worke 7^{s} 6^{d}	0	7	6
15	Given to Anthonie at Woddhouse 1^{s} and spent att Chester 6^{d}	0	1	6
16–17–18	There also spent on myselfe and my mare and given in the house to 3 servants 4^{s}	0	4	0
	P^{d} ffor a ffringe and a p^{r} of plaine gloves ffor A: B:	0	9	0
	and spent and given at Bowden 1^{s} 10^{d}	0	1	10
	P^{d} in the ffor two orders 8^{s}	0	8	0
	P^{d} to Alice Rowbotham ffor knitting a p^{r} of stockings	0	2	0
21	P^{d} to Harrie's hostesse ffor a 2^{d} q^{r} endinge att Midsummer	1	10	0
	to his M^{r} ffor a halfe yeares wage now also due	0	5	0
	ffor mendinge his shooes 4^{d} and given Geo Dooley ffor brynginge him back agayne to school 6^{d}	0	0	10
24	Given to Humfrey att Haddon and a man at Holme	0	1	0
	To Ed. Bargley 6^{d} and spent and given to the ostler this day and that former day	0	2	0
	P^{d} ffor 3 bookes at Manchester 1^{s} a pen and ink horn 4^{d} tobacco 6^{d} my diner and Wm Hollingsworth's 1^{s} our horses and given to the ostler 6^{d} and spent circa 6^{s} 8^{d}	0	10	0
30	Given to the servants att Holme 1^{s}	0	1	0
Julii 2°	Given to Geo. Buckley, of his midsomer rent 2^{s}	0	2	0
4	Given att Collecion and Co-ion att Stockport	0	0	5
7	Spent att Chappell ffaire and given to Jamie and to the ostler circa 7^{s}	0	7	0

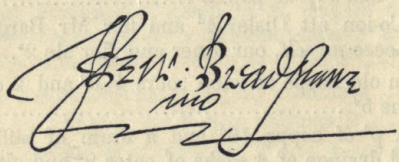
	P^{d} to Mr Joddrell ffor interest of 50$^{£}$ due at Ladie day last beinge the second yeare's paym^{t} att 4$^{£}$ teste Jo: Bullock	£4	0	0
10	P^{d} to Ka: Burges for a qr of Lamb 14^{d}, to Haslegrove for bread 2d, and Tho Marsland for 4 daies 10^{d}.....	0	2	2
	P^{d} to Richardson ffor waiving 22 yds of Sey	0	3	8
17	Given at Blakely 4d spent at Manchester circa 2/	0	2	4
	P^{d} ffor canvas and stuffe ffor a suite ffor myselfe	0	19	2
	P^{d} ffor a p^{r} of gloves and 3 wash balls 1' 6^{d}.....	0	1	6
20	P^{d} to Wm Richardson wief for 12 yds hemp clothe	0	12	0
	P^{d} to Jo: Bulloke ffor all my smithie work hitherto	0	10	0
	And to the glasier for mending a glass pane.....	0	1	0
26	Spent at Altringham and Bowden circa	0	5	0
27	Given to Bess, Rob: Sydbo: syster ffrom ffallowes	0	1	0
30	Spent att Stockport and given to a poore woman and ostler	0	1	5
31	P^{d} for mutton and bread 1/	0	1	0
August 1				
	Given at Co-ion table 3^{d} and to Snells for John Cottrell Thursday next 5^{s}	0	5	3
	P^{d} to Tho Robotham ffor 2 daies work 1/	0	1	0
5	Spent at Stockport 8^{d} for a p^{r} of gloves 6^{d} ffor pins points and laces 7^{d} ffor tobacco ffor pointon colliers	0	1	11
	P^{d} ffor beese wax 4^{d} ffor bread 2^{d} ffor candlewicks 3^{d} and for Kat: shoes 1^{s} 9^{d} and ffor 17 load of coles 19^{s} 8^{d}	1	2	2
12–13	Given at Woddhouses 6^{d}.....	0	0	6
	Spent at Stockport 1^{s} 10^{d} given to the ostler 2^{d} p^{d} for bridle and stirrups 2^{s}	0	4	0
16	Given one Talbott and his boy a p'tended souldier	0	0	6
	And to Thos Marsland for two daies worke 3d ...	0	0	3
17	P^{d} to Goddard Wythe and Clenton p. my poll 5^{s} and ffor 2 of my servants	0	6	0
18	P^{d} to Geo Bruckshaw ffor a newe springe for my watch and for stringinge itt 4^{s} 6^{d}	0	4	6
	Given to 3 servants at Eyam 1^{s} 6^{d}	0	1	6
20	Spent at Stockport 2^{s} 4^{d} given to an Altringham boy 4^{d} and the ostler 2^{d}	0	2	10
21	Given to A. W. p. dimidio p. pecc 1$^{£}$ and of her wage due att Lad: last 1$^{£}$ and 10^{s}	2	10	0

27	Spent at Stockport 4d given a poore woman 2d for T 2d			
28	P^{d} for a p^{r} of Stock: for Kat: 1^{s} given Dale of his wage 10^{s}			
	P^{d} for bread 2d ffor mutton ffor ale and dinner 6d to W Leather 3^{s} 6^{d} and lost at bowles att Greendale 1^{s}			
	Given to Peers Gaskell's men for venison 1/	0	1	0
7 bris 3°				
	Spent at Stockport 6	0	0	6
4	Paid ffor books att Manchester 4^{s} 8^{d} yesterday ostler 4^{d} spent 4^{d}	0	5	4
	P^{d} yesterday to Mr Bury's clerke ffor a pros: ffor 3 oxe twinters and 2 kine twinters pind in Macclesff ffold by Wm Hegg. 2^{s} and to Henry Cherie 19^{d}	0	3	7
5	Given at Co-ion table att Stockport 3^{d}	0	0	3
10	Spent att Stockport 4^{d} p^{d} ffor a cart sadle 4^{s} 6^{d}, ffor apples, a pecke 1^{s} and ffor Wheate a pecke 1^{s} 3^{d}	0	7	1
12	Given to a colleccion att Marple Chappell	0	0	2
16	Spent at Congleton 6^{d} ffor T. 4^{d} and ffor y^{e} ostler 4^{d}	0	1	2
	P^{d} by Jo: Wharmbie Junior to Rich: Wright of Northwiche 100$^{£}$ Teste the same Jo: and Jo: Robotham, this money was paid in the (blank)	100	0	0
18	to Mrs Claiton junior maid for plumbs and apples 4^{d}, for mutton and bread 14^{d} formerly spent ...	0	1	6
	for a pecke of Wheate formerly 15^{d} and ffor 2 day worke to Tho: Bennett 8^{d} and 4^{d}over then paid him	0	2	3
23	P^{d} for sope, bread and starch 19^{d} and for mutton a breast 7^{d}	0	2	2
24	P^{d} to Rob: Robo: mason fo 2 d: 1^{s} and Tho: Marsland 3 d: 1/	0	1	0
8br. 2°	P^{d} to Ro: Wyth for a lay for the poore at 2^{s} le p^{d}	0	2	8
	P^{d} for a doz of Peare tree trenchers 5^{s} for T. an oz 3^{d} for candles a p^{d} 5^{d} and spent 2^{d}	0	5	10
	Spent att Wilmslow 4^{d}	0	0	4
9	Spent vane at Wm Leather's 4^{s} and for bread 2^{d}	0	4	2
10–11	To a collection at Marple and a man att Wodhouses	0	0	8
13	Spent att Stockport on Jo: Butler his and my dinner, 1/	0	1	0
16	Given to a poore man 2^{d}	0	0	2

19	Given to Besse Arnefield for carrying 100[£] from my father's to my house 6[d]	£0	0	6
	Given to A. Wright p. le redd heiffer	3	14	4
21	Given to Marie 1[s], Peter, Jopp, and Anne, 1/6 ...	0	2	6
22	Spent att Stockport, 3[s] 4[d] given to Snell's wief 6[d] to Wm Thornelie 3[d] and p. tob. 3[d] a comb 2[d]...	0	4	6
23	P[d] ffor onions 1[s] a band of Leather 6[s] 4[d] a p[r] of bootes and shoes 17[s] to Rob : Thornelie for a week paveing 3[s] Rob : Robotham 4 daies 2[s] and making a p[r] of gloves 6[d] and to the fiddlers 4[d]...	1	10	2
29	Sp[t] 6[d] for a p[d] of candles 6[d] for a hoope of Wheate 8[s] for 3 stones of hemp to J. W. 14[s] for Beef and Suett 5[s] 6[d].....	1	8	6
31	Given to Mrs Warren at her child's christening 10[s] and y[e] nurse 2[s]	0	12	0
9bris 2°				
	P[d] 4[s] ffor 4 yds of hemp cloath to uxor Wm Richardson p. uxor Snells	0	4	0
	P[d] to Geo : Heginbotham for 5 and 6 Sub : att 22[d] le p[d] 2[s] 4[d]	0	2	4
5	Spent att Stockport 6[d] given to y[e] ringers 4[d] to a poore woman 1[d] for a breaste meate 3[s] 4[d] for a stone of hemp 4[s] 6[d] for an oz of T. 2[d]	0	8	11
8	P[d] Jack Redford for sweeping my chimneys	0	0	6
9	P[d] Ro : Ro : mason, for 6 days wallinge 3[s].....	0	3	0
12	P[d] for bridle and p[r] of stirrupps 2[s] and p. tob 2[d]...	0	2	2
13	Given to Al : Robotham p. F : Bennett 6[d] and to a poore man 1d.....	0	0	7
15	Spent at Manchester circa 5/ p[d] for 4 books 2[s] 10 For 2 p[r] gloves 3[s] for and sampler 2[s] for ...			
18	6 p[r] of band strings 9[d] for my mare all night and			
19	to the ostler 10[d] and spent at Stockport 20[d] and p[d] for a calfe skin 1[s] 4[d].....	0	17	5
22	P[d] for 15 sacks of oates dryinge to Bowman and Goddard p. Tho : Beeley 2[s] 6[d].....	0	2	6
24	and to Snells for wayving 35 yds of flaxen.....	0	6	0
	P[d] to Geo Elliott and Tho : Sydbotham my latter halfe yeare's lay, to our minister due Sunday next or next but one itt beinge 5[s].....	0	5	0
	P[d] for a qr[t] of Traine last weeke 10[d].....	0	0	10
	P[d] for a p[d] of candles last weeke	0	0	6
	Given to a boy from Mr Bostocke 4[d]	0	0	4

26	Spent at Stockport 8^{d} p^{d} for an oz of pep 2^{d} and T 4^{d}	£0	1	2
	P^{d} to Jo : Robotham for interest for y^{e} 100$^{£}$ from H. W. by Jo : Wharmbie the younger of Stockport 4$^{£}$	4	0	0
27	P^{d} to Tho : Bennett for tanning two calfe skins 1^{s}	0	1	0
28	Spent at Will : Leather's 8^{d} and given 2^{d} to a collecion	0	0	10
10bris	P^{d} ffor a through of leather 9^{d} for a basket 7^{d}	0	1	4
3	ffor bread since mich : for a shoulder of mutton and other necessaries	0	2	6
4	P^{d} att co-ion table att Stockport 4^{d} and to a traveling woman 2^{d}	0	0	6
5	P^{d} for eleven warne of salte att 9^{d} le warne	0	8	3
6	ffor ffrostinge the horse 1^{d} and given to Beeley 5^{d}	0	0	6
7	P^{d} newe coveringe my saddle besides my own things	0	5	2
	and given to ffra : Cottrell Boy p. bringing 6^{d}	0	0	6
10	Spent at Stockport 2^{d} p^{d} for a p^{r} of gloves for Harrie of old, a p^{r} of manacles and gloves for Kat 1^{s} and a q^{r} of pap. 6^{d}	0	1	8
12	Given Co-ion att Disley 4^{d} and ffor Mr Bargley Mr Leece myself, our diner and ffor ale 2^{s}	0	2	0
13	P^{d} for an old hoope of wine sours 4^{s} 6^{d} and 2 doz piggins 5^{s}	0	9	6
15	P^{d} for a p^{d} of hopps 16^{d} and a dram of saffron 4^{d} and dryinge of 4 sacks of oates 8^{d} and given old ostler at Cottrell's 4^{d}	0	2	8
17	Spent at Cottrell's 8^{d} and p^{d} ffor a sheet of pins and a thimble 5^{d} and given Rob^{t} Oaldham 6^{d}	0	1	7
20	P^{d} for my sonns later halfe years table p. Tho : Beeley	3	0	0
	ffor his halfe yeares schoolinge later halfe 5^{s} and for a p^{r} of shooes and other necessaries 4^{s} 10^{d} and given to y^{e} ostler at Macclesfield 3^{d} for killinge my sowe 1^{s}	0	11	1
22	P^{d} ffor a p^{r} of shooes for Kat : 2^{s} for soling my boots 3^{d} ffor tob. 3^{d} for killinge a calfe and cowe 15^{d} ffor Bread 4^{d}	0	4	1
	Given to a poore woman 2^{d}	0	0	2
	P^{d} to Jo : Heginbotham ffor Duffhouse green and Highfield	4	0	0
	and to Marsland Marg^{t} of old 4^{d} and ffor bread to Hasleg : 2^{d}	0	0	6

23	Given to Dale more of his wages and Ann Wright 1/	£0	2	0
24	Spent at Stockport 4^{d} p^{d} for Scottish cloath 1^{s} 6^{d} and for a pair of shooes for Harrie 2^{s} 2^{d} and 2^{d} to ostler..... ...	0	4	2
26	P^{d} ffor Mr Normansoll and my dinner and ale at Disley 1^{s} 8^{d} and to Dick Michill for tobacco case 1^{s}	0	2	8
28	To Peers Gaskell ffor venison a q^{r} of a doe 1^{s}.....	0	1	0
31	P^{d} ffor castinge 2 B : of W : to R : W : and ffor a (?) and to J : R : for goinge to S : for them ...	0	6	0
	Given to P. and Harie Newton 2^{s}	0	2	0



LIST OF THE BRITISH ROSES AND BRAMBLES OCCURRING IN THE LIVERPOOL DISTRICT.

By Mr. H. S. Fisher.

[Read 15th January, 1863.]

ROSA (Lin)—ROSE.

ROSA CINNAMOMEA (L.)—Cinnamon Rose.

Specimens of this Rose, collected by Mr. J. Skellon at Kirby, near where the railway crosses the river Alt, are in the Herbarium at the Royal Institution.

ROSA SPINOSISSIMA (L.)—Burnet-leaved Rose.

Very abundant upon all the sandhills, and occasionally inland.

ROSA HIBERNICA (Sm.)—Irish Rose.

This interesting and valuable addition to our list of local Roses was made during last summer by Mr. F. M. Webb who found it growing at Great Meols, Cheshire.

ROSA SABINI (Woods)—Sabine's Rose.

Liscard, abundant; Bromborough, plentiful; hedge near the toll-bar, Oxton; not found on the Lancashire side as yet.

Var. β. *Rosa Doniana* (Woods.)

Two or three bushes on the road, near Raby Mere, Cheshire.

Var. γ. *Rosa gracilis* (Woods).

With the former, but not so plentiful.

ROSA VILLOSA (L.)—Hairy-leaved Rose.

Bathwood, Ormskirk, rare. Mr. T. Williams.

ROSA TOMENTOSA (Sm.)—Downy-leaved Rose.

Frequent in hedges and thickets both in Lancashire and Cheshire.

Var. ? *Rosa fœtida* (Lindley's Synopsis).

Hedge at Rainhill, near the railway-station.

ROSA MICRANTHA (Sm.)—Small-flowered Sweet-briar.

A rose I gathered at Bromborough is considered as referable to this species by my botanical friends ; it, however, requires further investigation.

ROSA RUBIGNOSA (L.)—Sweet-briar.

Hedge at Bromborough village, probably an escape from cultivation.

A plant growing in hedges of fields, at Huyton quarry, seems to be this species ; if so, it is certainly indigenous at this station.

ROSA CANINA (L.)—Dog Rose.

Hedges and thickets, very common.

Var. γ. *Rosa surculosa* (Woods).

West Kirby, Cheshire.

Var. δ. *Rosa dumetorum* (Woods.)

Hale, near the church ; Bootle &c.

Var. ε. *Rosa Forsteri* (Sm.)

Bromborough, Rainhill, Walton &c.

Var ? *Rosa dumalis* (Bechstein).

A rose belonging to the canina section with very much cut and jagged leaflets and distinct in general appearance, which I found by the pits near the entrance to Bromborough woods, has been so named by J. G. Baker, Esq., of Thirsk, a gentleman who is well acquainted with the continental forms of our British roses.

ROSA ARVENSIS (Hud's)—Trailing Dog-Rose.

Hedges and thickets, very common.

Rosa inermis.

This plant is apparently quite naturalised in the hedge of a field at Ormskirk.

RUBUS (Lin.)—BRAMBLE.

RUBUS IDŒUS (L.)—Raspberry.

In ditches and woods, plentiful in the drains of all the mosses round Liverpool.

RUBUS PLICATUS (W. and N.)—Upright Blackberry.

Bank, Seven-pits, Aintree road, 1854. Patrick Wood, Cheshire.

RUBUS AFFINIS (W. and N.)—Related Bramble.

Ditton, near the railway-station; rare.

RUBUS LINDLEIANUS (Lees)—Lindley's Bramble.

Common in woods and thickets.

RUBUS RHAMNIFOLIUS (W. and N.)—Buckthorn-leaved Bramble.

Hedges at Eastham, Claughton, Walton, Hale &c.; frequent.

RUBUS DISCOLOR (W. & N.)—Two coloured-leaved Bramble.

Hedges &c.; very common and abounding with singular and marked varieties.

RUBUS THYRSOIDEUS—(Wimm.)

A plant agreeing with the description of this species occurs at Bromborough, Cheshire (1853.)

RUBUS LEUCOSTACHYS (Sm.)—White-clustered Bramble.

Hedges about Walton and Walton Rakes; plentiful.

Var. β. *Rubus vestidus* (Weihe).

Walton; rare.

RUBUS CARPINIFOLIUS (W. and N.)—Hornbeam-leaved Bramble.

Hedges, Walton, Claughton and Bromborough woods.

RUBUS VILLICAULIS (W. and N).

Claughton, Cheshire; occasionally. F. M. Webb.

RUBUS MACROPHYLUS (Weihe).

Claughton, Cheshire; rare. F. M. Webb.

Var. ? *Rubus umbrosus* (Arrh).

Claughton and Oxton, Cheshire; occasionally. F. M. Webb.

RUBUS MUCRONULATUS (Bor).

Patrick Wood, Cheshire.

RUBUS SPRENGELII (Weihe)—Sprengel's Bramble.

Hedges, Everton, 1854; Claughton Woods; frequent.

RUBUS ROSACEUS (Weihe).

Hedges, Walton, Bold Bridge Farm, Farnworth quarry, Claughton.

RUBUS SCABER (Weihe)—Scabrous Bramble.

Patrick Wood, Bromborough. F. M. Webb.

RUBUS KŒHLERI (Weihe)—Koehler's Bramble.

Hedges, Walton, Everton, Bromborough &c.; frequent.

Var. γ. *Rubus pallidus* (Weihe).

Woods and thickets, Cheshire; frequent.

RUBUS DIVERSIFOLIUS (Lindl.).

Hedges and thickets, Cheshire; frequent. Lancashire; rare.

RUBUS CORYLIFOLIUS (Sm.)—Hazel-leaved Bramble.

Hedges &c.; very frequent. A form with very much cut and jagged leaflets and *flexuose panicle* occurs at Walton in the fields, behind Skirving's nursery.

RUBUS TUBERCULATUS (Brab.)—Bramble of the Bushes.

Hedges at Walton and Everton; frequent: has not yet been found on the Cheshire side.

RUBUS CŒSUS (L)—Dewberry.

Hedge-banks; occasionally. Sandhills, both sides the Mersey; very common.

ON THE HABITATS OF SOME OF OUR BRITISH FERNS.

By Nicholas Waterhouse, Esq.

(Read 15th January, 1863.)

I am afraid the present paper will be found open to the criticism that it is more remarkable for its omissions than its contents. For several summers, during many mountain rambles, I have watched the growth of our British ferns, and all that I can now profess is to embody the results of the observations I have then made. Several species of ferns are only to be found among the most beautiful scenery of our island, and to bring back their fronds is almost a certain proof of the character of the district where you have wandered. The botanist or the fern fancier enjoys advantages which are sometimes denied to those engaged in kindred pursuits. During the last summer I twice crossed the range of fells in Westmoreland, which from the Roman road on its summit bears the name of High Street. Both expeditions would have been most unsatisfactory to the archæologist. Whether it was that the sight of such remains is only vouchsafed to the eyes of the faithful and believing, or that the very wet season had produced an unusually verdant crop of grass, I do not know; but I could not discover on the broad mountain's brow anything more impressive than a narrow sheep-path. On both occasions the weather was warm and hot mists enshrouded the more distant landscape in a manner which would have been most disappointing to the artist; but I was amply rewarded for my labour by finding a ravine unusually productive of the more beautiful kinds of ferns. The beauty of this genus

of our wild plants depends almost entirely on the place of their growth, whether they just contrive to exist in some place exposed to the wind and sun, or whether they unfold their delicate fronds under the shelter of the moist and dripping rock, or in the shady hedgerow, or in the rich damp soil of the woodland.

A mountainous country is their chosen abode. It is curious to observe the great variety of soil and climate which may be found in districts of this kind, the many aspects you may obtain in a limited space, the effect of the currents of air, some hot, some cold, the reflecting power of some rocks, the cooling power of others, the bleak exposed summit with its cold piercing blasts, the warm steamy valley, the different character of the various streams, the little rills trickling down the cliffs, the *beck* dashing wildly down the stony gully, throwing showers of spray now on one side, now on the other, now flowing cold and icy through the deep glen, now spreading in lazy pools among the flat meadows where the sun has power to heat its surface. There is no slight difference between the boggy summit of the fell, mother of the *beck* and the river, source and feeder of the *tarn* and the *mere*, and the bog which way-lays the stream already formed, in the valley below. Again, the heather of the moor, the pine forest and the oak copse have each their influence on the growth of minor plants. Still greater is the effect produced by the mineral character and position of the rocks, whether slate or limestone or sandstone, whether a hard volcanic or a porous rock. It is curious to observe what an equable temperature is maintained in some places at a great height on the mountains; for instance, there are certain places in Westmoreland where the mountain's brow breaks away very sharply and suddenly to the eastward, whilst massy spurs or ridges defend the hollows thus formed to the north. The winter snows are heaped up in glens of this kind, forming a warm covering for

the more tender Alpine plants till the spring is somewhat advanced, whilst in summer the mists and showers again shield them from any excess of heat. In such places the sunshine, when there is any, is far brighter than in the smoky atmosphere of our towns.

If we wish to grow ferns ourselves we must take the trouble to see the places where they grow naturally, and the various circumstances of locality, soil &c., attending their growth, and though it may not always be very easy to extemporize a waterfall or to establish a permanent atmosphere of Scotch mist, still if we imitate these conditions to a certain extent, we may reasonably expect to be rewarded with some measure of success.

We now only value the fern for its delicate form and the colour of its fronds, but if we examine the herbarium of the rocks, we shall see how much we are indebted to its congeners of the ancient world—how the ferns and the fern allies of pre-Adamite ages, the Lycopods, the horse-tails, the mosses, have been pressed and dried and preserved Hermetically in stone, and thus have furnished an aid without which modern ingenuity would have been brought to a stand-still, without which the iron way from Liverpool to Manchester would never have been carried over the quaking surface of Chatmoss, without which the iron ship would never have ploughed the broad waters of the Atlantic, without which the countless shuttles of Lancashire would never have "merrily *gone* flashing "through the loom." Would that I could say they now were doing so.

In bringing the subject of the habitats of ferns before this Society, I must premise that this is by no means a rich locality; the rapid growth of the town, and the rapidly increasing study of all branches of Natural History have driven away many of our wild flowers. No doubt two centuries ago, when the batteries of Prince Rupert were playing on Liver-

pool and when a tidal estuary flowed within a hundred yards of this building,* a much richer collection of botanical treasures might have been made than at the present time. Now one hears of a solitary *Osmunda* growing wild in Aigburth, the last of its once numerous class, of a wall on Billinge Hill as the only habitat in these parts of the Scaly Spleenwort, and of the Sea Spleenwort being very rarely found on the rocks near the Mersey.

The *Aspleniums*, the family of ferns which I shall take first, have nine representatives in Great Britain, and these nine may be subdivided into three minor families, each member of these latter subdivisions bearing a considerable resemblance to the others. *Asplenium Marinum, A. Lanceolatum* and *A. Adiantum Nigrum* form the first of these families. *A. Marinum*, the Sea Spleenwort, with its thick leathery frond covered with fructification of a rich, almost golden, hue, loves the rocks overhanging the sea or the cave where it may drink the briny spray from the ocean. Its rootlets attach themselves to very narrow fissures in the cliffs where there is hardly any soil. Its love for the coast proves that it likes a moist equable temperature. In this neighbourhood it is still to be found near the Mersey, on Hilbre Island, on two or three places on the Ormes Head, abundantly in sea caves near Tremadoc, and on several headlands on the Welsh coast. It grows in more abundance at Iona and several other places among the western isles of Scotland, where the climate is tempered by the influence of the gulf stream. In cultivation its fronds attain a considerable size, but they do not produce the rich mass of fructification to be found on those growing in their natural habitat, the sea cliffs. *Asplenium Lanceolatum* bears a certain resemblance to the preceding—forming a connecting link between it and the succeeding fern, though the most delicate of the three. It can hardly be called a native of this

* Free Library.

part of the island; but I have found it growing plentifully on some rocks in the neighbourhood of Tremadoc. It flourishes in rocky situations near the sea, especially on the south-western coasts of England, in Cornwall, and the Channel Islands.

The *Asplenium Adiantum Nigrum*, Black Spleenwort, is much commoner than either of the preceding, and bears a certain resemblance to them in form. It may be that the more sheltered localities in which it grows enable it to develope a more divided frond. It is a fern very widely distributed: I have found it attaining considerable size beneath the hedge rows of Berkshire; but the largest specimens I have ever seen were from North Wales, on the slope of the hills leading inland, about two miles from the coast. As a wall fern its growth is short and stunted. It is very common about Oban and other places in the west of Scotland. On the whole, it flourishes best at a certain distance from the sea, in situations where it finds shade, a certain amount of warmth and a light soil.

Three other Spleenworts may be classed together, namely, *Asplenium Germanicum, A. Septentrionale* and *A. Ruta Muraria*. They are all rock ferns, they are all diminutive in size, they all possess a certain grass-like character, and they are all exceedingly unmanageable under cultivation. *A. Germanicum* is exceedingly rare, but a few specimens have been found on Snowdon. *A. Septentrionale* is rather more plentiful; it has been found on the rocks in Borrowdale, and a few other places in the Lake District; also near Snowdon and other parts of North Wales. *A. Ruta Muraria*, Rue-leaved Spleenwort, is a very common fern, growing abundantly on old buildings, on old stone walls, on the tombs in the church yard and under the shelter of damp rocks, though it seems chiefly to love the habitations of man. There is hardly a more difficult plant to grow. Damp stones form its

natural habitat, but it gives immediate signs of decay if there is the slightest excess of moisture.

Three other spleenworts form the third and last family, *Asplenium Trichomanes*, *A. Viride* and *A. Fontanum*. The first, or common spleenwort, is abundant in the moister parts of England on walls, which in some places are almost covered with it. It struck me that, after the very mild winter and very humid spring of 1861-62, there were an unusual number of seedlings in the walls in some parts of Westmoreland, enough for once to make up for the depredations of tourists. The finest specimens of this, and indeed of many other ferns, are often to be found on the sides of some well, where they grow to a great size and of a colour unusually delicate, having the full amount of shade and moisture they require. The best specimens for cultivation are generally to be found in heaps of shingle near quarries or similar situations, whence they can be removed without destroying a single rootlet.

Though very closely resembling the last species in form, *Asplenium Viride*, Green-stalked Spleenwort, is a much rarer and shyer plant. *A. Trichomanes* flourishes by the road side, and accepts the resting place the common stone wall affords; it is also much more common in the valleys than on the heights. *A. Viride* is to be found, and then only rarely, high up on the rocky side of the mountains, sometimes by the side of some tiny rill, and never except in places where it must enjoy more than its fair amount of mist and rain. My experience is that it is generally to be found on rocks with an eastern aspect. The Rev. Gerard Smith, in his "Derbyshire Ferns," states that it never grows except in a northern aspect. If my observation is right, I think it would imply that it prefers a certain amount of warmth. I have found it plentifully near Llyn Idwal, also on Snowdon, and on Moelwyn in North Wales; near the High Street Fells, on Seat Sandal, and in Easedale in Westmoreland. It either is or was to be found on the eastern side of Helvellyn,

and on Honister Crag. But it is not a common fern; any of these mountains might be hunted over without detecting a single plant. I have never found it in Derbyshire, but I have obtained fine specimens from that county. The finest plants I have ever seen were in a gully in the mountains, from 1,800 to 2,000 feet above the sea. At one part of this gully, on a precipitous bank about seven feet above the stream, I found a small cave from the roof of which a most beautiful mass of *A. Viride* was growing. In situations it likes it seems to be a spreading fern, whether by offsets or by seed I do not know. In cultivation it grows exceedingly well; and not only sends up strong healthy fronds, but they bear an unusually large amount of fructification. *Asplenium Fontanum* is one of the rarest of our ferns. In one of the localities where it is said to have been found last century, Wybourn (Wythburn) in Westmoreland, it has certainly never been seen of late; and some of the local botanists believe the original statement to be erroneous. It has been suggested that it so much resembles *A. Viride*, that it may often have been passed by unobserved.

I have never found the True Maiden Hair, *Adiantum Capillus Veneris;* it is one of the rarest and most beautiful of the British ferns, one of the connecting links between the plants of the south-west of England and those of Madeira and the Mediterranean. I am informed by Mr. Tyerman, of the Liverpool Botanic Gardens, that he has found it frequently in the Isle of Man, but of very stunted growth, not much larger than *A. Ruta Muraria*, and indeed much resembling it in form.

Allosorus Crispus, Parsley Fern, grows most abundantly on the mountains of Wales and Westmoreland, also in similar districts in Scotland. Nowhere does it flourish more luxuriantly than when its fronds have to make their way through a heap of shingle, especially if it is on a sloping hill side and

liable to be occasionally put in motion. In such situations the roots of the fern have very ample protection. Mr. Lees, of the Naturalists' Club at Malvern, says that he once found a small patch of the Parsley Fern on the Herefordshire Beacon, towards the Holly Bush Hill, but that it was a solitary patch; he had never seen another on the whole of that range of hills. I think this shows that it requires a considerable amount of moisture; on the wet, misty mountains of the north and west, it flourishes under all manner of hard usage, whilst on the dry and sunny slopes of the Worcestershire hills it starves and dies.

Athyrium Filix Fœmina, Lady Fern, is one of the most graceful of its tribe, whether we consider its habit of growth, or the elegant bend of its fronds, or the delicacy of their colour. Few of our wild plants are so widely distributed; but it seems to prefer shade and moisture, the sides of a deep ditch, or the bank beneath some spreading tree. Some of its varieties are exceedingly beautiful and curious; but I cannot say I have ever been so fortunate as to find any.

Blechnum Boreale, Northern Hard Fern, is not valuable on account of its rarity. In its ordinary form it certainly is not beautiful; but sometimes it may lay claim to our attention when, on the borders of some copse wood, we see its fertile fronds curled up like croziers, bright red in hue, and just beginning to unroll; or, in some moist piece of ground under the shelter of a dripping rock, we find its barren fronds broad, ribbon-like, verdant and of unusual size. In cultivation it does best in boggy sandy soil.

Cetarach Officinarum, Scaly Spleenwort, I have never found. It is a wall fern, growing chiefly in the limestone districts, in Derbyshire, near Bristol, near Settle, Kendal &c. I believe on rocks or walls, which suit its growth, the Scaly Spleenwort is to be found in considerable abundance, though

it may be confined to a very limited locality in that district. It likes moisture, and has an especial love for the damp mortar in old walls. On the whole, this curious looking fern grows well in cultivation.

Cystopteris Fragilis, Brittle Bladder Fern, is one of the most graceful species in Britain. It is not uncommon on old walls or houses, especially in limestone districts. I have seen it growing with *Ruta Muraria* on the tombs in a churchyard in Shropshire. It grows on Snowdon, on Moel Siabod and near Llyn Ogwen, in Wales. In Westmoreland it is tolerably abundant; it is to be found in all the little gorges coming down from Fairfield and Helvellyn and the neighbouring fells, where it gets shelter from the rocks and water from the streams. I have several times found it growing with the much rarer fern *Asplenium Viride.* In Westmoreland, though it is occasionally to be found by the road side, it seems to prefer a certain height on the hills, from 800 to 1,500 feet. But, in Derbyshire, it seems to grow more luxuriantly than anywhere else. It grows as freely in the limestone walls about Buxton as *Asplenium Trichomanes* does on the walls near Rydal, or *Asplenium Adiantum Nigrum* on some of the walls near Conway and Carnarvon. On the limestone cliffs near the Lover's Leap, it attains a great size; sometimes, in autumn, the varied tints assumed by the fronds beginning to fade add an additional beauty to this exceedingly graceful fern. It is one which does well in cultivation, loving moisture and shelter.

The *Hymenophyllums* form the connecting link in some respects between the mosses and the ferns, and are certainly among the most interesting of their tribe. *H. Tunbridgense* is much the rarer of the two. I am afraid the great demand for ferns is much reducing the number of its habitats. Passing through Tunbridge Wells last March, I enquired for it at two nurserymen's shops; at one I was told that they procured all the specimens they sold from Devonshire,

or other distant parts; and at the other, they made a great mystery of the source of their supply. I found, however, on some rocks in the neighbourhood, a small patch growing very fairly which is now in my possession. It also grows on the rocks in some private grounds in that part of Kent and Sussex. I have since found it on rocks near Llanberis. *H. Tunbridgense* has a shorter, more shapely frond than *H. Wilsoni*. It grows chiefly in the southern parts of England and Ireland; at Killarney it is very abundant on rocks and in the shade. It seems to require warmth and a close atmosphere; but I doubt its requiring as much moisture as its hardier and more robust relative. It is also found in much less elevated situations.

Hymenophyllum Wilsoni is by no means uncommon in the north of England, in places which suit its growth. I have found it near the Swallow Falls, on Snowdon, Moelwyn, Moel Siabod, Moel Hebog, the Pass of Llanberis and other parts of Wales; in Borrowdale, on the banks of the streams flowing to Watendlath, in the gorges on the Langdale Pikes, in the gullies on the western side of Thirlmere, on Helm Crag, in Easedale, on some rocks on Loughrig but very poor and stunted, in Deepdale and also a little in Grisedale. The manner of its growth is exceedingly curious; it cannot live on the rocks near the stream where the water might occasionally overflow its roots and cause them to rot, nor can it live on the rocks at a height above the stream, where it would be exposed to the rays of the sun, but on that middle belt of stone, neither too high nor too low, where it may drink the spray from the stream, it flourishes exceedingly. In some of the gullies near Thirlmere, on this line of rocks, it is much more plentiful than any of the mosses. A spore of its seed sometimes rests in the damp part of some bare stone; there it germinates, and attaches itself; gradually its creeping roots spread, sending up a mass of semi-transparent fronds, which in time covers the whole

rock, absolutely growing without soil except what the fern makes by its own decay. In such places, however, the fronds are generally stunted and less than the ordinary size. Sometimes a spore takes root in some patch of moss; and, as the supply of moisture is greater and more permanent, will generally produce a much larger plant. On rocks which are shaded from the sun and often shrouded by mist it grows very freely. The *Hymenophyllums* seem to possess great tenacity of life; in times of drought they often become masses of parched, brown and apparently lifeless fronds; as soon, however, as the rains commence and the mists again clothe the mountain tops the tiny transparent fronds, of the most delicate shade of green, begin to shoot upwards. As you see it on the rocks when the mist causes it to drip with moisture it forms a really beautiful object. It seems to prefer a northern aspect and also to flourish where it is entirely overhung by rocks. I have found it with the Oak Fern growing among it, also with some of the more beautiful of the mosses; for instance, the *Bartramia Pomiformis*, the Apple Moss, richly laden with its beautiful globes of green. Though *H. Wilsoni* is of much more vigorous growth than *H. Tunbridgense*, I think the latter seems much more manageable and *satisfactory* in cultivation.

Trichomanes Radicans seems nearly allied to the preceding; it is amongst the most delicate and the rarest of our ferns. The places where it is known to grow are few indeed; of late, however, one has heard of several who have chosen to explore the glens of Kerry for themselves, and have been rewarded by bringing home as trophies very fair specimens of this famed Killarney fern. The conditions of its growth are so very similar to those of the *Hymenophyllums*, that any one travelling in that part of the South of Ireland might well spend a short time in examining localities where it would be likely to grow.

Of the large and common family of the *Lastreas*, including *Filix Mas* and its varieties, I mean to say little. *Lastrea Thelypteris*, the Marsh Fern, one of the rarest of the family, was found in a wet meadow at New Church, near Delamere Forest, on one of the Field Naturalist excursions of last summer; it also grows in a meadow near Llanberis. *Lastrea Oreopteris*, the Mountain Fern, is one of the most attractive of its tribe, whether we consider the delicate green colour of its fronds, the graceful form in which the leaflets are placed, reminding one of the blade of a paddle, the manner in which the seed vessels are ranged like a dark braid round the edge of the green frond or the fragrant smell they give out when pressed. It is said not to do well in cultivation. Its great want is shelter from the wind. The habitat it generally prefers is a sloping hill-side and a turfy soil, where the super-abundant moisture quickly drains away from its roots, and where it finds some shelter from the violence of the stormy blast.

The *Osmunda Regalis*, Royal or Flowering Fern, is much the largest of its tribe in Britain: fronds have sometimes been found ten to twelve feet in height. The amount of root required to sustain such a superstructure is immense, as every one must know who has attempted to dig up the black wiry mass from which it springs. It is by no means an uncommon fern in moist and boggy districts. In few places is it more plentiful than in this county, where it is to be found on all the mosses round. On Parr moss, close to the Railway Station at the St. Helen's Junction, it grows in considerable abundance; it also grows in some of the lanes near Speke and Hale. In the Lake District it ornaments the banks of the Brathay and some of the other streams; but so much has been carted away that it is by no means as plentiful as it used to be. It likes a certain amount of warmth; in one district where I have observed it I found it grew on the sheltered banks of the streams as they came down from the hills but

not on the exposed bogs where those streams took their rise. Its fronds perhaps attain their greatest size on the banks of the Long Range at Killarney, where they enjoy warmth, moisture and shelter.

The *Polypodiums* are ferns of great beauty. *P. Dryopteris*, the Oak Fern, grows among the fallen leaves in the copse wood, or by the shaded side of the stream, or not unfrequently among the boulders on the mountain side, where its root creeps along, fully protected from the weather, and its fronds make their way upwards among the stones. I have found it on Moel Siabod, near Capel Curig, near Dunkeld in Scotland, very fine in Borrowdale, in a wood at Skelwith, among the rocks in Easedale, on the sides of Helm Crag, Fairfield, and on most of the Westmoreland fells. In cultivation it succeeds much better than the Beech Fern ; but in a wild state it is much the rarer plant. Shelter and a light soil are all that this most graceful fern seems to require.

Polypodium Phegopteris, Beech Fern, is by no means uncommon. How it gained its name, what connection there may be between it and the beech, I am at a loss to discover. It is fond of a stony abode, often it is to be found creeping along the bottom of a wall—there are some very large patches of it in such a situation by the roadside between Grasmere and Keswick and also between Llanberis and Capel Curig. It is often to be found spreading among a pile of stones or flourishing in some moist nook beneath the rocks. It loves water and a moist atmosphere, and is nowhere to be found in greater beauty than when growing in some narrow cleft in the rock by the side of the dashing stream or waterfall, where it receives occasional showers of spray. In cultivation it should therefore receive more than its fair share of moisture. I have found it in many parts of North Wales, near Llanrwst and the Snowdon range, in Scotland, and at Ambleside, Keswick &c., in the Lake District.

Polypodium Calcareum, Limestone Polypody, very closely resembles the Oak Fern, but it is of much more robust growth. It is also much less common, only being found in limestone districts. In the neighbourhood of Buxton, at the Lover's Leap and other places, it grows most luxuriantly in the fissures of the cliffs. I have found it a plant less satisfactory in cultivation than either of the preceding.

Polypodium Vulgare is to be found on old walls, on hedge-rows, on trees almost everywhere. Its varieties are some of them very beautiful. The one called *Serratum* I have found several times in North Wales, but have never been so fortunate as to find the genuine *Cambricum*.

The *Polystichums* appear to flourish on the limestone hills of Derbyshire as much as anywhere else. Some years ago, whilst stopping in that county, I found a cave of some size, the mouth of which was rather low and ornamented with a fringe of *Polystichums* (*Lobatum* I think) of great size and beauty. On a more recent visit, I found that some local bookseller had published a map, in which he had marked the place as Fern Cave, and consequently had brought there a swarm of restless Vandals (they could not have been naturalists), who had, to use an American expression, "blenkerized" the whole place; not a fern was left which could possibly be reached.

It never has been my fortune to find the rare Holly Fern, *Polysticum Lonchitis*. It is becoming scarce on the upper rocks of Snowdon. I hear it has been recently found on one of the Westmoreland Fells.

Scolopendrium Vulgare, Hart's Tongue, is a very common plant. It loves a damp, shady situation—old moats, deep, wet ditches, the mouths of old deserted mines—such are its favourite habitats. From such localities fronds are said to have been gathered three feet long and five inches wide. About Hale it grows to a considerable size. The finest I have

ever seen were in some very deep ditches, entirely sheltered from the sun by thorns and bramble bushes, in the neighbourhood of Furness. No fern so frequently sports and produces fresh varieties both in a wild state and in cultivation. At the meeting of the British Association at Manchester, a fern-grower at Todmorden exhibited a very large collection of the varieties of some of the British Ferns, especially of the Hart's Tongue, the Lady Fern and the Northern Hard Fern, but it is doubtful whether the greater number of these will prove persistent.

The *Woodsias* are very rare and have only been found in a few places on the Snowdon range, in Teesdale and the Highlands. They seem to like inaccessible places and in some of their habitats can now only be obtained by those who choose to be slung down the cliffs by a rope. I lately heard from a friend that he had found the *Woodsias* together with *Asplenium Septentrionale* in considerable abundance in Norway.

The subject which has recently engrossed the attention of that portion of the scientific world which is engaged in the study of natural history is the Origin of Species. Has all animated nature sprung from one type, or from a very limited number of types? Have all the trees of the forest and the flowers of the field been produced from one seed, or from a very small number of parent seeds? Have the weeds—should I not rather say the flowers?—of the sea been changed into the radiata and so into the articulata? Has the fish acquired powers of living and moving on dry land? Has the reptile, with its loathsome form, passed into the songster, gaily carolling in the pure ethereal vault of heaven? Has the struthious bird, formed by its Maker to seek its food on the vast sterile wilderness, lost the power of flight, and thus been formed into a kind of connecting link between the feathered fowl and the four footed beast, whose life is confined to the surface of the earth? Are we to suppose that some bear, of

very aquatic tastes, has found it possible to pass its whole life in the salt seas, subsisting on the animated life they produce, the form of its body suffering

> "A sea change,
> "Into something rich and strange;"

its mouth increasing vastly in size, its fore paws becoming fins and its hind paws growing into a monstrous tail? Or that the offspring of this amphibious bear should, as generations pass away, become the ancestors of the immense Greenland whale? Are we to believe that the gabbering imitative ape is but a lower form of the reflecting self-dependent man?

I confess I cannot see why we should adopt views such as some of those which have been brought forward—why we should think that every gulf in our way is so easily to be bridged over. I cannot see that because the Creator of all things has disposed all his creatures in a wonderful order, has arranged them with admirable symmetry in a graduated scale, has formed them not fantastic and dissimilar, but with a certain relation to each other, that they are therefore sprung from one source, or from a very small number of sources. If we say from one source, we must almost conclude that they are self-created.

Without adopting the theories which have been propounded, I have no doubt this controversy will result in proving the close connection which exists among the often dissimilar varieties of the same tribe, and that many diverse specimens are sprung from a common origin. Look at our British Ferns—Can we doubt that many species are sprung from the same stock, and have acquired their present characteristics from a long course of growth in very dissimilar localities? For instance, *Asplenium Marinum*, with its tough, leathery fronds, loving the sea cave and the salt spray, has a certain relation to *Asplenium Adiantum Nigrum*, with its much more complex frond, growing luxuriantly in the shady bank beneath

the hedge row, whilst *Asplenium Lanceolatum* seems to form an intermediate link. Are not the differences in the formation of these three plants probably due to the physical differences of the places of their growth?—those differences so long established that it is now imposible to grow the one from the seed of the other. In the same way, the difference between *Asplenium Trichomanes* and *A. Viride* is very slight and may easily be explained by the different character of their ordinary habitats; the one stronger and hardier, growing on rocks and walls in the lower country, where at times it is liable to suffer from drought; the other, generally high up on the fells, only in places where there is plenty of moisture, and where the colour of its frond may have grown delicate and green from the influence of frequent mists. The two *Hymenophyllums* resemble each other very closely; yet, who has seen the more robust *Wilsoni* assume the more spreading frond of the *Tunbridgense*, or the more pointed seed vessel of the former become jagged at its mouth like the latter? The connection between the oak and the beech fern is very near, and the connection between the former and the limestone polypody still nearer; so much so, that we might look for a common origin for these beautiful ferns. Yet no one has succeeded in growing one from the other. So much for the permanence of species, the characteristics of which have been developed by a long course of growth in certain localities. It may be said there are ferns the form of which we can change and which will produce most curious and beautiful varieties under cultivation. The Hart's Tongue, for instance, will produce a divided and a subdivided and, indeed, a perfectly branched frond; the edge will become frilled and curled, or jagged, or narrow like a strap, or broad, almost circular, in shape. In the same way the Northern Hard Fern, the Lady Fern, the Male Fern, all change almost under our eyes. These changes, however, are evidently owing to accidents of soil and

aspect. They are rarely persistent and such plants readily go back to the parent type. Cunning gardeners will very likely produce more remarkable varieties than any we now have.

In these few pages I have attempted to put down some observations on the growth and dwelling place of this most graceful and beautiful tribe of plants, and having done so let me apologize for ever having undertaken the task. Very loud are the lamentations of every lover of nature on the wholesale devastations which, year by year, are being made on the rarer specimens of ferns, and many doubts are felt whether any will soon be left by the road side or by the mountain stream. The author of the "Ferns of Derbyshire" grows very indignant against a certain bearded dealer, who brings his packages from Westmoreland to sell or to exchange for the natives of the former county. Lest similar accusations should be brought against me I have veiled most of my localities in the widest terms, so that the fern fancier will not find them without a certain amount of labour and careful observation. That labour amid the finest scenery our island affords is most health-giving and delightful; those observations cannot but be the source of instruction and enjoyment. I can only wish that whoever undertakes this branch of field botany may be rewarded by as many successful mountain rambles as have fallen to my lot.

AN ACCOUNT OF THE LIFE AND WRITINGS OF THE LATE HENRY BUCKLEY.

By T. T. Wilkinson, F.R.A.S. &c.

(Read 5th February, 1863.)

For more than a hundred years the operatives of Lancashire and Yorkshire have been peculiarly distinguished for their love of pure geometry. Most of these were purely self-taught men, and owed their ultimate fame to ability only. Located in groups,* which spread over the two counties, and even extended into Cheshire and Northumberland, they pursued their studies at the loom, or in the mine, undeterred by difficulties; their diagrams being either sketched on slates which they hung upon their weaving-frames, or mentally depicted so as to be seen only by the "mind's eye." Yet, whether in darkness or in seclusion, they laboured on, diffusing their influence around, until at length they succeeded in giving a tone even to the studies of our universities. A wandering journeyman hatter (Fletcher) in process of time connected them with some kindred spirits resident in the metropolis—the journals of the day began to include some of their best speculations and, ultimately, pure geometry reigned supreme in the hands of Wolfenden, Ryley, Butterworth, Whitley, Swale, Hilton, Lawson, Gompertz, Campbell, Smith, Cunliffe, Holt, Rutherford and Kay. These able geometers, as well as many others whose names I have not space to mention, took the ancient Greek forms of Geometry for their models and at times well nigh exhausted the subjects they undertook to investigate. But, in general, it may be said that they

* Transactions, vol. xiv, p. 29.

followed no settled plan in their courses of study; and hence their isolated solutions require some previous systematic arrangement before their real value can be perceived. When this has been done the Greek geometry will be found to owe several most important extensions to their skilful handling; and some of our ablest modern writers on these subjects will be seen to have been indebted to the pages of our mathematical periodicals for many of their best examples. On several former occasions* I have directed attention to the labours of some of these able men and endeavoured to systematize a portion of their writings. In what follows I propose to add one more to the number of those worthies, and to offer his example to those self-taught aspiring students who are not yet extinct in the counties of Lancaster and York.

Henry Buckley was born at Turney Bank, in Saddleworth, on the 11th March, 1811. In early youth, he was sent to a dame-school in the village, but the instruction there given did not extend beyond the merest rudiments. On arriving at manhood he was scarcely able to read or write but, having become acquainted with some young men who were studying geometry, he began to feel himself degraded in their company and determined to imitate their example. Elementary reading and writing were soon mastered. Arithmetic and Mensuration followed in their wake, and he then mustered courage sufficient to attack the "Elements of Euclid." By diligence and perseverance he mastered the eight books of "Thomas "Simpson's Geometry" in a very short period, and then began to apply their principles to the solution of problems and theorems. In this he was assisted by the late Mr. John Butterworth, of Haggate, near Oldham and, in process of

* See my paper "on the Lancashire Geometers, and their Writings," volume XI. of the "Manchester Memoirs;" also, "The Life and Writings of Swale;" and "Liverpool Mathematicians," in former volumes of these "Transactions."

time, Mr. Buckley became a worthy disciple of that worthy man and able geometer.

Although Turney Bank is at a considerable distance from Haggate, Mr Buckley was not deterred either by this or the state of the weather from visiting his tutor several times a week; and on the occasion of one of my last visits to Woodhouse, he pointed out with allowable pride, not only the bleak road towards Haggate, over the Saddleworth moors, but also the quiet nook in one of the fields adjoining where he used to pursue his studies undisturbed by the bustle of the world. It was here that he conceived some of his best processes; and it was here also that he *thought out* the analyses of many of those difficult problems which occasionally puzzled both his tutor and their common friends, the late Mr. John Whitley, and Professor Davies. As may be expected from his associates, his taste was almost wholly geometrical. Geometry was ever his favourite subject of thought, although his papers contain sufficient to prove that algebra, trigonometry, series and the calculi had not escaped his attention. His highest ambition, however, was to follow in the steps of Mr. Butterworth, and in this he succeeded in an eminent degree. Of his numerous solutions of problems and theorems, now in my possession, the great majority relate to the construction of triangles from given data—to sections of ratio and of space—to inclinations, porisms &c., of which a small portion has been contributed to the "Diaries," the "York Courant" and the "Educational Times." From the numbering of some of his collections it would appear that he intended to form them into separate essays; but the most extended are necessarily very incomplete. In what follows it is proposed to point out the nature of some of these investigations, and to add an occasional specimen of his mode of treating the subjects under consideration. The problems of Inclinations, combined with those of Tangencies, give rise to

many curious constructions. There are many questions of no easy nature, belonging to this class, in Mr. Buckley's remains. I may select the following as not unworthy of notice :—

QUESTION I.

It is required to describe a circle to pass through the centres of two given circles, to cut them in C and D, so that C D shall be of a given length.

Construction. Let A B (fig. 1), be the centres of the given circles: join A B, and produce this line to *a*, making B *a* = the given distance C D; produce B *a* to M so that B M : B *a* : : B C : A D. From the points M, A, draw the lines A C, M C, to meet the circle (B) in C, so that A C : M C : : A D : B C : the method of doing which is well known; —then through the points A, B, C, describe the circle A B C, and C D joining the points where this cuts (A) and (B) will be the line required.

Demonstration. Join A D and C D. Then $\angle$ A D C = $\angle$ C B M; and if *a c* be supposed drawn parallel to C M, we have B M : B *a* : : B C : B *c*;—and by cons. B M : B *a* : : B C : A D. Hence A D = C B. Again, by parallels *c a* : C M : : B C = A D : B C; and by cons. A C : M C : : A D = B C : B C. Consequently A C = *a c*. Lastly, because $\angle$ A D C = $\angle$ *c* B *a*; A D = B C; and A C = *c a*; $\therefore$ C D = B *a* = the given line by construction. Q. E. D.

QUESTION II.

It is required to describe a circle to touch two right lines given in position, so that if a line be drawn from one of the points of contact, parallel to another right line given in position, to meet a given circle, the intercepted chord may be of a given length.

Construction. In the given circle (Q), (fig. 2) apply D E = the given chord, and demit Q R, perpendicular to D E, meeting it in R. Then with centre Q, and radius Q R,

describe the circle Q R I;—draw the tangent G I F C parallel to the right line given in position, meeting A C in C. At the point C erect the perpendicular C P, meeting the line A B, which bisects the $<$ C A B in P;—then P is the centre of the required circle.

Demonstration. Describe the circle C P B. This evidently touches the lines given in position; and since C F I G is drawn from one of the points of contact parallel to the other line given in position, and D E and F G being at equal distances from Q, $\therefore$ F G = D E, the required intercept. Q. E. D.

By a similar combination of Tangencies with the different cases of the Section of Space, Mr. Buckley has produced a series of very interesting results, but the complexity of the requisite diagrams precludes the possibility of inserting more than the following neat example:—

QUESTION III.

To describe a circle to touch two right lines given in position, so that if a right line be drawn to touch this circle, parallel to another right line given in position, the rectangle of the segments made by the point of contact may be equal to a given rectangle.

Construction. Let A B, A C, be the lines given in position (fig. 3); describe *any* circle (O_1) to touch them, and draw D F parallel to L M, the other line given in position, and touching it at E. Join A and the centre O_1, upon which take A O, a fourth proportional to D E, E F, A O_1^2, and the given rectangle. With centre O thus obtained, describe the circle O G to touch the lines A C, A B, and it will be that required.

Demonstration. Draw B G C parallel to L M, touching the circle (O), and meeting the right lines in B and C. Then by similar figures A O_1^2 : E D. D F :: A O^2 : B G. G C. But by cons. A O_1^2 : E D. D F :: A O^2 : given rectangle. $\therefore$ B G. G C = given rectangle, and B G C is drawn parallel

to L M, the right line given in position. But the circle (O) touches A B and A C; and hence it is the one required. Q. E. D.

Problems respecting Ratio are very numerous. Many of them embrace the properties of two or more circles and appear well worthy of transcription, did space permit. The following will suffice for illustrating his method of treating one of the more difficult combinations :—

QUESTION IV.

Three points being given, it is required to find a fourth, such that, if a circle be described with it as a centre, and a given radius, tangents drawn to it from the three given points may have given ratios to one another.

Analysis. Suppose the circle described (fig. 4), with the given radius and centre O, so that the tangents A D, B E, C F, drawn from the given points A, B, C, may have the given ratio. Join A O, B O, C O, and draw the radii, D O, E O, F O. Then, per conditions, m : n :: A D : B E; or, m^2 : n^2 :: A D^2 (A O^2—O D^2) : E B^2 (B O^2—E O^2). Upon O E take O I, a fourth proportional to m^2, n^2, and O D^2 or O E^2; with centre B, and radius = the side of a square = O E^2—O I^2, describe a circle, to which draw the tangent O G, and radius B G. Then, since m^2 : n^2 :: A O^2—O I^2 : B O^2—O E^2 :: H O^2 : B O^2 — (O E^2—O I^2) = B O^2 — B G^2 = G O^2. Hence m^2 : n^2 :: A O^2 : G O^2; or A O : G O :: m : n. Therefore, A O has to G O a given ratio, and ∴ the locus of the points of intersection of A O and G O is a circle by Prop. 11, Book 11, Dr. Simson's "Locis Planis." In the same manner it may be shown that A O has a given ratio to a tangent to a circle whose centre is C. These loci being described, will evidently intersect in O, the centre of the circle required. Hence the *Construction* and *Demonstration* are obvious. It may be remarked that the loci will intersect in two points, either of which may be taken for centre.

Fig. 1

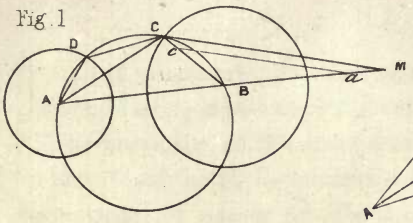


Fig. 2.

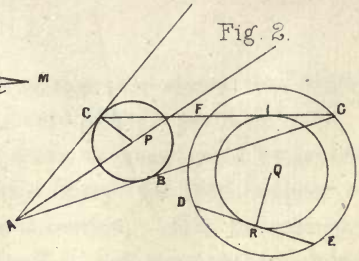


Fig. 3.

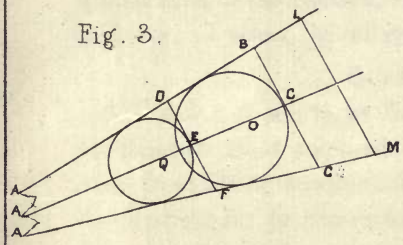


Fig 4.

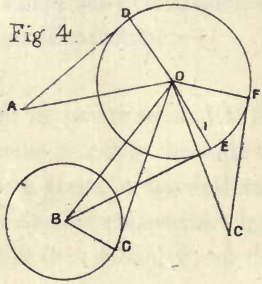


Fig 5

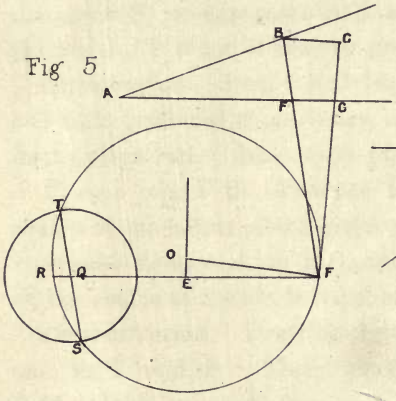


Fig : 6

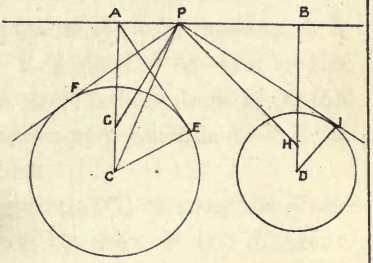


Fig 7.

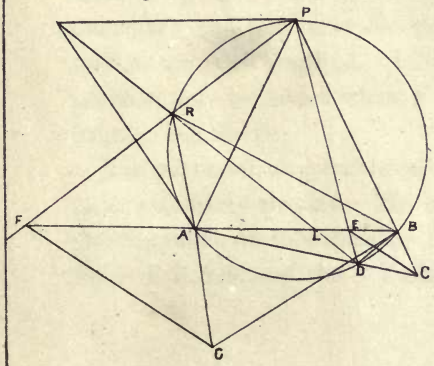
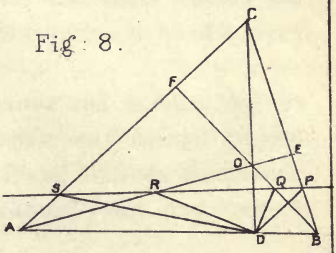
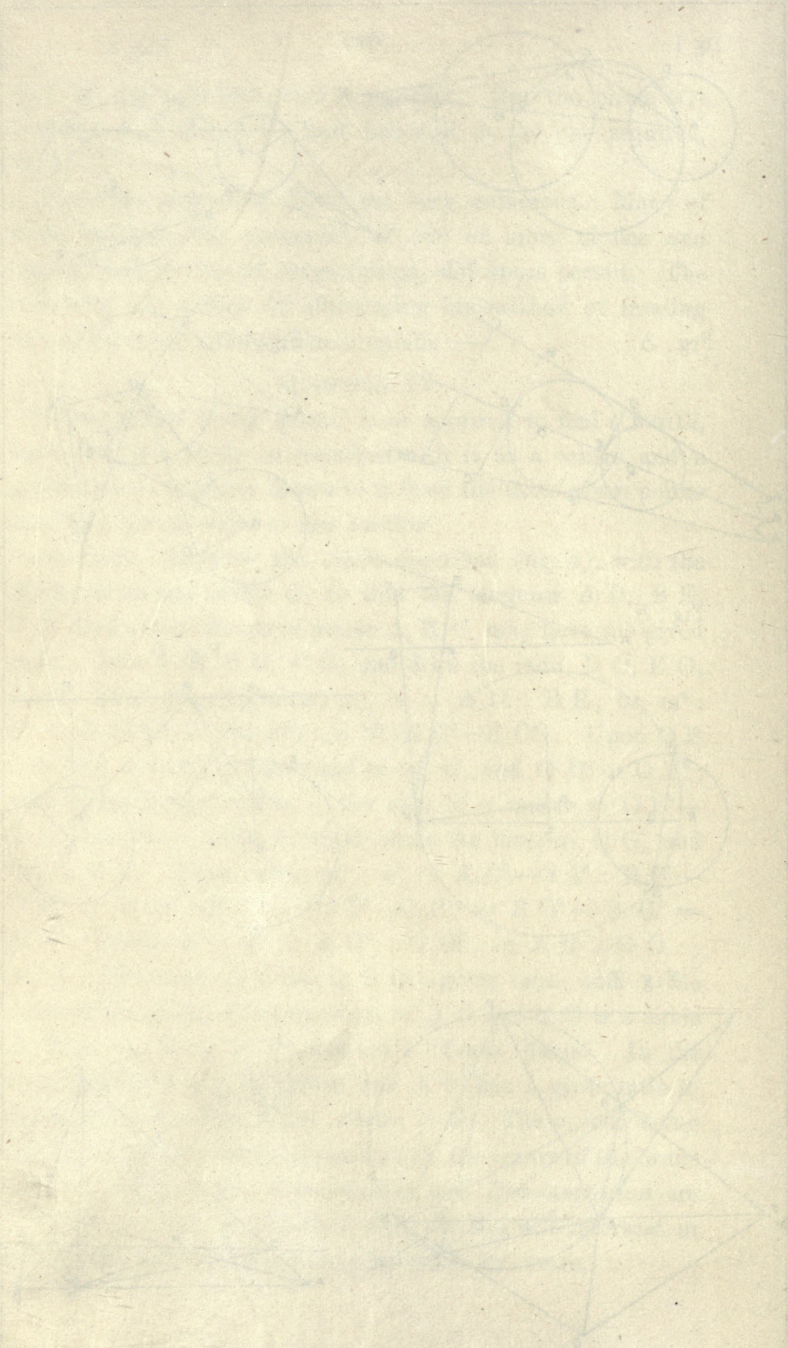


Fig : 8.





In a note appended to this question it is stated that "Mr. "John Whitley considered it a very difficult problem."

The properties of Bisectant Axes, as investigated by myself in the "Lady's and Gentleman's Diary" for 1853, appear to have occupied much of his attention. His manuscripts contain a graduated series of well-chosen examples involving applications of the method, some of which are of considerable difficulty. I select the following as an illustration :—

QUESTION V.

A B and A C are right lines given in position, and P is a given point: it is required to describe a circle through the point P, to *bisect* the circumference of a given circle, and such that if a tangent be drawn to the circle to be described from the point P, it may meet A B and A C in B and F, so that the ratio of P F : F B may be given.

Construction. Demit P C (fig. 5) perpendicular to A C, and in it, produced if necessary, take C G so that P C : C G in the given ratio; draw G B parallel to A C, meeting A B in B, and join P B. Produce P Q until P Q. Q R = the square of the radius of the given circle; then draw E O, the *Bisectant Axis,* meeting P O, drawn perpendicular to P B in O, the centre of the circle required.

Demonstration. Describe the circle (O) meeting the given one in T and S. Then, since by cons. P C : C G :: F P : F B; ∴ P F has to F B the given ratio. Again, since P Q. Q R = T Q^2, the line T Q S is evidently a diameter; and the circle also passes through P. ∴ the circle (O) is the one required. In nearly the same manner the problem may be solved when F B is required to be of a given length. Q. E. D.

His treatment of geometrical maxima and minima appears to be peculiarly elegant. He communicated several curious investigations of this class to his friend William Tomlinson, Esq., F.R.A.S., of the "York Courant," and they form a

portion of the very meritorious mathematical correspondence in that journal.

The following was probably intended for the same destination had that series of questions been continued:—

QUESTION VI.

Two circles being given in magnitude and position, it is required to determine a point P in a right line A B given in position without the circles, so that if tangents be drawn from this point to the circles, their ratio may be the greatest or least possible.

Construction. From C and D (fig. 6), the centres of the given circles, let fall the perpendiculars C A and D B, upon the line A B given in position; draw the tangents from A and B to the circles; take A G and B H equal to these respectively; and by Prop. III, page 70, "Gentleman's Diary," for 1837, draw G P and H P to meet A B in P, so that their ratio may be the greatest or least possible; lastly, from P draw the tangents P F and P I, which are those required.

Demonstration. Draw the tangent A E, and join C E, C F, D I. Then by cons. A G = A E, and $A G^2 = A C^2 - C F^2$. But $P F^2 = P C^2 - C F^2 = A C^2 + A P^2 - C F^2 = A P^2 + A E^2 = A P^2 + A G^2 = G P^2$. Hence, P F = P G; and in the same manner it may be shewn that P I = P H. But by cons. P G has to P H the greatest or least ratio possible, and ∴ the tangents P F and P I possess the same property. Q. E. D.

In other portions of Mr. Buckley's manuscripts I find some elegant properties of Poles and Polars, with especial reference to the Prize Question, No. 659, in the "Educational Times." The quadrature and tracing of curves form the subject of several other papers, some of which are very neatly investigated by means of pure geometry. He also considered and extended Castillon's problem of inscribing "a triangle in a "given circle, so that its sides shall pass through given

"points;" but here again the complexity of the requisite diagrams will not admit of my giving more than the enunciations of the most curious. They are as follow:—

Problem I. In a given circle it is required to describe three circles to touch each other and the given circle, so that the sides of the triangle formed by drawing tangents at the three points of contact of the given circle, and the circle required to be described, may pass through three given points not in the same straight line.

[This is Castillon's and Malfatti's problems combined. The investigation is very lengthy and includes various cases of several subsidiary problems.]

Problem II. In a given circle, it is required to describe three other circles to touch each other and the given one, so that two of the sides of the triangles formed by drawing tangents at the points of contact, as before, may be parallel to lines given in position, and the remaining side pass through a given point.

[This investigation is also lengthy, and he remarks at the close that there are *fourteen* other cases of this problem yet to be considered.]

The analyses of the preceding involve considerable difficulty, and evince an amount of reading which reflects great credit upon their author. His power of invention is conspicuous throughout; and this, together with the admitted elegance of his writings, entitles him to rank high amongst our modern geometers. Nor was he less successful in the investigation of Porisms, considered geometrically. Several of these have been contributed to the "Educational Times," but by no means the greater portion. At one time he intended to publish a small work on this difficult subject; but various causes prevented his carrying this intention into effect.* The following may be adduced as an example of his mode of procedure.

* Those who desire to see a complete restoration of the three lost Books of Porisms, may be referred to "Les trois Livres de Porismes d'Euclid,

QUESTION VII.

A B is a given chord of the given circle A P B, and P is a given point in its circumference; another point Q may be found, and also the position of A B, such, that if *any* right line be drawn from Q meeting the circle in R and D, so that A D may have to B D a given ratio; the ratio of A R : B R is also given and may be found.

Construction. Let A P B (fig. 7), be the given circle, P the given point, and A D the given chord. At P draw the indefinite tangent P Q, parallel to which draw A B ; draw the tangent A Q, meeting PQ in Q, the point required.

Demonstration. From Q draw any right line, Q R D meeting the circle in R and D, so that A D : B D : : r : s, the given ratio. Join A R, B R; and P R meeting A B, produced in F; draw also A P, B P, D P. In R A produced take R G = R B, and join F G and B G; then produce A D till D C = D B; join B C, and let Q D and P D cut A B in L and E. Since the triangles A P B, A Q P, B D C, are similar, and also D E B, D A P; hence D B : B E : : D P : P A; and ∴ D P. B E = B D. P A = B C. P Q. Whence D P : P Q : : C B : B E. But by similar triangles and parallels A L : L E : : A D : A C : : A E : A B. ∴ AE^2 = A L. A B. Again, < G R B = < A P B, and hence the triangles, G R B, A P B, Q A P, B R F, P A R, are similar, and F B : A P : : B R : P R;—∴ F B. P R = A P. B R = P Q. B G. Whence F B : B G : : P Q : P R, and the triangles P Q R, F G B, are also similar, and B G is parallel to P R F, and Q R D to F G. ∴ A L : A F : : R A : A G : : A F : A B. ∴ AF^2 = A L. A B, and hence, A F = A E. Finally, because the line Q R D is drawn so that A D : B D : : r : s, and since A E : E B : : A D : D B. ∴ A E = A F : E B : : r : s. Consequently, A R : B K = R G : : A F : B F = 2 A F + B F; or, A R : B R : : r : 2 r + s, a con-

"par M. Chasles," Paris, 1860, one of the most remarkable works of this great geometer.

stant ratio :—the given chord A B has also the required position, and the point Q is therefore the one required.

From the above we obviously deduce the following :—P is a given point posited in the circumference of a given circle P A B, and A B is a chord given both in length and in position; another point Q may be found, such, that if lines be drawn from *any* point D in the circumference of the circle, through P, Q, cutting A B in L, B; the rectangle A B. A L $=$ A E^2. Q. E. D.

I add the following from the same manuscript :—

Porism I. Three circles having their centres in the same straight line, being given in position and magnitude, two straight lines may be found that will also be given in position, such that, if tangents be drawn from *any* point in one of the circumferences to the other two, and perpendiculars be demitted from the same point on the lines to be found; the rectangle of the tangents shall be a mean proportional between the sum of the squares of the two perpendiculars and a certain given space.

Porism II. Two circles, one included within the other, being given in position and magnitude, two right lines may be found given in position, such that, if from any point in the lesser circle perpendiculars be demitted upon the lines to be found, and through the same point an ordinate to the greater circle be drawn; the sum of the squares of the perpendiculars will always have a constant ratio to the square of the ordinate. Hence also this

Problem. Three circles being given in magnitude and position, whose centres are in the same right line; it is required to find in one of them a point, such that, tangents being drawn to the other two, their rectangle may be given.

In other portions of the papers, I find several neat theorems of considerable importance. An investigation of one of these

is given by way of illustration, and the enunciations of several others are added as exercises for the student.

QUESTION VIII.

If perpendiculars be let fall from the angular points of a triangle upon the sides; and if, from the extremity of one of these perpendiculars, lines be drawn to the other two perpendiculars, and also to the two remaining sides, making equal angles with them all on the same side, then the feet of these lines shall all range in the same straight line.

Solution. Let A B C (fig. 8), be the triangle, A E, B F, C D, the perpendiculars meeting each other in O, and the sides in E, D, F, respectively. From the point D, draw D P, D Q, D R, D S, making equal angles with B C, B F, A E, and A C. Then since D is a point in the circle circumscribing the triangle B C F, the points P, Q, S, are in a right line. (See *Diary*, 1845, p, 62). And since D is also a point in the circle circumscribing the triangle A F O; the points R, S, Q, are also in a right line. Hence the points P, Q, R, S, are in a right line, as stated in the enunciation. Q. E. D.

Theorem I. Let A B C be any plane triangle, A E, C D, B F, the perpendiculars meeting the sides in E, D, F, respectively, and let L be their point of intersection. Bisect A C, B C, and A B, in P, Q, R, and erect the perpendiculars P G, Q H, and R I, respectively equal to L B, L A, L C. Join I G, G H, H I, and the triangle A B C = $\frac{1}{4}$ I G H.

Theorem II. The continued product of the radii of all the circles which can be described each to pass through the angular points of any plane triangle, and cut the circumscribing circle and a circle of contact at right angles = $\left\{\frac{a\ b\ c\ (a+b+c)\ \Delta}{16\ (a-b)\ (b-c)\ (c-a)}\right\}^2$.

Theorem III. Let three parabolas be described to the three sides of a plane triangle, and have their principal axes in the lines bisecting the angles, and let a normal be drawn from

the point of contact of each parabola with that side which its principal axis intersects; then the product of these normals is equal to the product of the distances of the angular points of the triangle from the centre of the inscribed circle.

Did space permit, I might add considerably in illustration of other portions of the ancient geometry, and give his *generalizations* of some of the most curious questions in the "Mathematical Companion." Mr. Butterworth was always fond of such extensions, and no doubt would urge his pupils to make similar attempts. Some of Mr. Buckley's latest papers contain a series of interesting problems of this nature; but the preceding will suffice to prove that he was a geometer of no mean order.

In almost every instance the Greek models are faithfully copied, and in some instances the variations of the data, with the corresponding modifications in the constructions, are pointed out with a minuteness worthy of the Alexandrian school.

In his earlier papers the historical bearings of the questions under consideration are not very well defined. This is not the case with some of his later discussions, several of which are very carefully annotated. This can be satisfactorily accounted for from the fact that in early life he was unable to procure the necessary works of reference; but, on attaining middle age, his abilities and high moral character had become known; he was soon engaged in several important offices of trust, and was fortunate enough to marry a lady who was possessed of a genial disposition, and considerable property. From this period his library began to increase. Every work of note was purchased as soon as published; and besides these he collected a large number of the works of the continental geometers, both ancient and modern; so that at the time of his decease he had formed one of the most curious and valuable collections in the district.

But the possession of property did not prove to him an unmixed good. He became involved in a long and expensive Chancery suit respecting some portion of a woollen mill at Delph; and although he ultimately sustained his rights, it was not without considerable expense, both of time and money. During one portion of the proceedings he was obliged to retain possession of the property by sleeping on the premises. The room was cold, damp and unhealthy; and he unfortunately contracted a disease which developed into consumption. After suffering for a considerable period, his naturally robust constitution gave way, and he died as a Christian should. This event happened on the 15th of July, 1856, when he was in the 47th year of his age: his widow followed him to the grave exactly three years after, and their ashes rest together in the burial ground attached to St. Thomas's Church, Friarmere, under a marble slab on which an inscription appropriately commemorates both the virtues and the abilities of the deceased.

ON THE SCARCITY OF HOME-GROWN FRUITS IN GREAT BRITAIN; WITH REMEDIAL SUGGESTIONS.

By C. Roach Smith, F.S.A. &c.

[*In a Letter to Joseph Mayer, F.S.A. &c., Vice-President.*]

(Read 7th May, 1863.)

My Dear Sir,

Since I have resided in the country I have been led to consider a fact which does not appear to have excited the attention of the public, although it is one of great importance, affecting the health and comfort of the great majority of the population; indeed, it may be said, of almost the whole of the working classes and particularly of those residing in towns. It is *the great scarcity and consequent high price of fruit.* I have been at some pains to ascertain the nature of the food which supplies the daily wants of the cottager, of the townsman, of our soldiers and of our sailors; and I am well convinced that, in a sanitary point of view, the day is not far distant when the Government will feel bound to make inquiry and help to remedy an evil the effects of which may be most disastrous.

Nature intended that fruit and vegetables should constitute at least the chief support of man. They are indispensable to his healthful existence, as may be proved and is yearly strikingly proved, by depriving ships' crews of this species of food. Some years since the boys in Christ's Hospital were so infected with cutaneous diseases that they were compelled to be sent home; and so general and bad was the malady that a medical

inquiry was instituted. The evil was proved to have resulted from the want of fruit and vegetable diet. Now if a school such as this, richly endowed and watched over, is liable to be infected with loathsome disease from the absence of natural food, can we be surprised that millions of our fellow-creatures, steeped in poverty and ignorance and of improvident habits, are the victims of a neglect or misunderstanding of one of nature's primary laws ?

That my remarks may not take a discursive range, or seem indefinite, I will limit them to one or two of the main fruits which should be upon every poor man's table ; but which have become so scarce and expensive that they are almost luxuries upon the tables of the rich. First of all stands The Apple. We learn from Solinus that Apples were, in his time, so common in Thule* (Shetland) as to constitute the chief winter food of the people. But, at the present day, how many of the Irish have ever seen an Apple-pudding ? Even in Kent (a reputed fruit county), it is nothing uncommon to find Apples towards the month of January fetching from 2s. to 3s. a gallon ; and I have known them supplied to a nobleman's family in the spring, at the rate of from 4d. to 6d. per Apple ! Now the climate of Ireland is not worse than it was in the time of the Romans. Britain seemed then, much as we find it, always covered with fogs ; but Apples grew abundantly ; and would flourish much more plentifully now, because a wide extent of waste land has been brought into a state of cultivation ; and we will admit there is more horticultural science.

Am I attaching too much importance to the Apple ? Produce it upon the dinner table in any shape, and nine hundred

* Thyle larga est, et diutina, pomorum copiosa. Qui illic habitant, principio veris inter pecudes pabulis vivunt, et lacte in hyeme compergunt arborum fructibus. Cap. 35, edit. Ven. 1473. See Mr. Hogg's remarks on this passage in his Paper on Iceland, printed in " The Transactions of the Royal Society of " Literature," vol. vi, p. 324 *et seq.* The " ultima Thule" of the Romans was probably Mainland, the chief of the Shetland Islands.

and ninety-nine in a thousand will devour it with avidity. Of all fruits it is, perhaps, the most valuable. It is extremely wholesome: less than any it tires the appetite, for it may be served daily and be ever acceptable. Yet it has become a forbidden fruit not only to the Irish, but to the great mass of the English: so far as I have been able to learn it never finds a place upon the board of thousands of families even in the country; and, of course, of tens of thousands in towns; and it is never supplied to our soldiers and sailors.

I have referred to Solinus to shew the abundance of Apples in *Ultima Thule*. If they were so common in the north, it may be inferred they were equally so in other parts of Britain. That they were cultivated everywhere in the middle ages there can be no doubt. Brand's "Popular Antiquities" contains an immense number of references to the Apple. The old custom of "wassailing" the Apple trees at Christmas to make them fruitful (a relic of pagan superstition) was universal throughout England and is not yet quite extinct. But the trees no longer exist to be "wassailed." Even within our memory, where large orchards were cultivated we see now only a few old, cankered stumps, producing nothing and cumbering the ground. From some cause or other the general cultivation of this valuable fruit has become more and more neglected, while the population has gone on rapidly doubling and re-doubling itself.

It is true the science of Horticulture has given us a wonderful variety of Apples; and we know, perhaps, better than our ancestors how to produce and manage the choicer kinds expeditiously and in little space: Mr. Rivers tells us how to grow them upon pyramids and dwarf bushes as thick in beds as gooseberry and currant trees. But these blessings are not for the million, although they could be supplied, without difficulty, with Apples equally valuable and easily attainable at a very cheap price.

The easiest mode of verifying my assertion that the culture of the Apple is insufficient, is for any person to examine the gardens as he passes through any part of the kingdom. Where he may detect one with two or three Apple trees, he will find twenty or thirty without one. And yet a single tree will produce, according to age, from one bushel to six or seven sacks. If well-meaning noblemen and gentlemen, who take so much pains in constructing what are called "model "cottages" for labourers, would see that these labourers are industrious and provident, a well stocked garden would be insisted on; but at present this grand accessory to the cottage, this vital source of half the year's subsistence, is left out of consideration; or it is made a matter of little consequence.

There are enormous tracts of ground, tenanted by thousands of persons less blessed than the class I have just alluded to, which, with just as much trouble as would be an amusement, might be cultivated; and would be cultivated if the masters of these men did their duty. The better-regulated French, even when encamped for a short time upon waste ground, will soon convert the waste into gardens, which occupy their leisure time, find them wholesome food and keep them sober, cheerful and contented. But in the districts in England to which I allude (take for example those of the Brick-makers)* squalor and wretchedness, drunkenness and high wages go together. Neglected by their masters (who only look to the work to be done), their gardenless hovels are the picture of misery. Gaining wages enough to keep them, with provident care, through the winter their only solace is the beer-shop; and

* In referring to this class of labourers I make especial allusion to their general character; and such as I know it to be in this county and in Essex. But I should be doing injustice to my friend, Mr. Henry Dodd, were I not to point to his excellent management and the consequent sobriety and good conduct of his men. His extensive establishments at Yeading, near Uxbridge, and in London, prove what can be accomplished when the master is intelligent and philanthropic.

for most of the winter months they subsist by begging or stealing, or live in the workhouse. I make no doubt that gardens would be books of instruction to them, and induce habits of foresight, industry and sobriety to which they are at present strangers.

But how are we to provide Apples on an extensive scale to make them of general utility? Nothing is more easy. Be ever planting trees. I will give you a notion of what might have been done and could yet be done, by the directors of our railways. Who will calculate the exact number of the thousands of miles of unoccupied land by the sides of our various lines? It is an easy task, and I here supply an estimate of what may be produced in a single mile. One mile would require about 250 trees, the cost of which, and the labour of planting, would be about £15. As good, strong trees should be selected, in three years they would pay their expenses; and in a few years more we may calculate that, out of the 250, about 200 would produce five bushels each which, at 3s. per bushel, would be £150; and, of course, if both sides of the mile of railway were planted, the returns would be £300; and for 100 miles we may calculate £30,000. But make yet a deduction for contingencies, and the profit would be enormous. There is no reason, moreover, why our highways and byeways should not be planted with fruit trees (especially the Apple); and also the vast tracts of land which surround hospitals, fortifications and other public buildings.* One of the most absurd objections that has been opposed to my suggestion is that the fruit might be stolen! A highly intelligent friend of mine, who keeps a large and respectable school, has, or had, a considerable space of unoccupied wall, the advantages of which

* Since writing the above I have had an opportunity of laying my views on this subject before the Chairman of the London, Dover and Chatham Railway; and I have hopes that, in consequence, my suggestions will be at least partially adopted. If so, it is probable we may soon see the waste ground of our lines of railways yielding the shareholders a good profit from an unlooked-for source.

for fruit trees I pointed out to him. He met my persuasion with the common objection, a fear of stealing. I observed, "your boys must eat something; let them steal: or consider "the fruit their own; and, if you want any, get up in the "morning early and steal from them." But, where such large quantities of fruit as I contemplate would be grown, stealing to any extent need not be apprehended. How is it that in France we see the roadsides for miles lined with Apple trees? Is it that the French are more honest than we? If so, let us endeavour to rise to their standard of honesty.

The French not only grow large quantities of Apples, upon which the working classes feed to an extent quite unsuspected in our country; but they export to England the main portion of what comes into the public markets.*

Before I leave the Apple let me give you the result of my experiments on the keeping of this useful fruit. I am not aware that similar experiments have been made and published. The Apples are allowed, generally, to hang too long upon the trees. The ripening of every kind should be anticipated; the fruit should be gathered before the ripening commences; and this process should be allowed to take place in a dry cellar, from which the light is excluded. Guided by this sure and simple rule, I have preserved Apples in perfection many

* "I have this evening, 20th Nov., 1815, passed through Covent Garden, and "seen upwards of 1,000 casks of Apples that have been imported from France; "and not less than an equal quantity heaped together in warehouses near Fleet "Market, containing in the whole not less than 40,000 bushels. The fruit itself "consists of fine specimens of several varieties, which appear with us nearly "extinct, and these are grown mostly on the opposite coast to this country; and "as there must be some cause for the abundant crop in that country in a season "when we have scarcely any, would it not be advisable for our agricultural "societies to send over some intelligent person to inspect the nature of the "orchards in that country; and, if possible, endeavour to ascertain in what the "difference of culture consists? Some writer on agriculture, I think Mr. Young, "recommends to young farmers, at certain seasons to 'take their nags and see what "'their neighbours are about.' Would it not be equally prudent for the growers of "fruit here to endeavour to find out what their rivals on the other side of the "channel are doing? The fruit I have this evening seen is, at a moderate calcu-"culation, worth *twenty* thousand pounds, at the price it is selling for in the "London markets."—*Hints addressed to Proprietors of Orchards etc.*, by William Salisbury. London, 1816.

months after my neighbours' heavier crops, allowed to ripen on the trees, have rotted.

The Pear will, probably, ever remain a luxury. It demands more attention than the Apple. There is an old proverb which, to a certain extent, correctly shews the tardiness with which the Pear tree comes into bearing :—

> "He who plants Pears
> Plants for his heirs."

Now this is true as regards some varieties of the Pear, if left to themselves ; but we may plant and have fruit too with perfect safety ; and whereas it has been stated that a *seedling* Pear tree may be expected to bear some time in the course of half a century, I have one which, although only five years old, is shewing a promise of fruit buds for 1864. I reversed the order of nature ; and instead of allowing it to stand still and take its own time, I moved it yearly and restrained its roots by pruning.

Next to the Apple I place the Vine, a tree but little understood, although, like the Apple, it might be made a national benefit. There is a general belief that the Vine can only be made to ripen its fruit in hot-houses and green-houses ; and so prevalent is this notion, that a Vine on the open wall, properly pruned, is seldom to be seen. People cheat themselves into error ; and imagining that their convictions are based on reasoning, give themselves no further concern and sit down in contented despondency. Our forefathers knew better (as I am attempting to show in my "Collectanea Antiqua") : they actually made the Vine productive as a standard in the open ; and this to a much greater extent than people suppose, or are willing to believe ; for the mode of culture which our ancestors adopted is now unknown ; and people, seeing the Vine constantly fail upon walls, erroneously conclude that it cannot succeed under less favourable circumstances. For fail it will, both upon walls and as a standard in the open, unless

what may be called its physiology be studied and understood. When this is comprehended we may make sure of securing an abundance of its delicious fruit every year without any expense or trouble. I say yearly, because such a season as that of 1860 only comes once in a man's life; and experience and a close study of the capabilities of the Vine in the open air prove that what is commonly called "a grape season" is but little better than an excuse for ignorance or want of industry. How far north the Vine can be made productive upon open walls is yet to be ascertained. Mr. Hoare considers as far as the fifty-fourth parallel of latitude; "and even "beyond that in favourable seasons:" up to this point he concludes that, by good culture, a crop may be depended upon yearly.* Although failure does not invariably follow bad management, yet it must be confessed that, in our climate, to ensure constant success scientific culture of the Vine is indispensable. The knowledge required is so simple, the leading principles by which the pruner must be guided are so few and so clear, that the whole art may be attained by a few hours' study. On every foot of wall, except such as face the north, it is possible to grow a pound of grapes; and it will therefore be obvious how great would be the produce were only one quarter of the unoccupied walls of our houses, cottages and gardens stocked with this prolific and valuable tree. The above-quoted writer asserts "that the surface of "the walls of every cottage of a medium size, that is applicable "to the training of Vines, is capable of producing, annually, "as many grapes as would be worth half the amount of its "rental." The Grapes, besides forming a daily dessert for months, make an excellent wine, even when unripe; and so do the young shoots, tendrils and leaves which, in large quantities, are taken from the Vines in the summer pruning. By the addi-

* A Practical Treatise on the Cultivation of the Grape Vine on open walls; by Clement Hoare, 3rd edition. London: Longmans, 1841.

tion of water and more or less sugar wines may be made so closely resembling those of Champagne and Anjou in France and the dry Rhenish wines that, at a most trifling cost, what is now the refuse of the Vine may be converted into a wholesome and cheering beverage, no longer to be restricted to the table of the rich but attainable by all.

A productive Vine is now a rarity. Probably on an average there is not one to every 500 houses: I even think we may say not one to every 1000 houses. Some thirty years since in my immediate neighbourhood, that is to say in Rochester and Chatham, one gardener (Mr. Wildish) pruned yearly upwards of ninety Vines: now, I doubt if there are so many properly managed and in a fertile condition (upon open walls) in the entire county of Kent. On the walls of the thousands of labourers' cottages which I have examined I have scarcely ever observed a solitary example. The few that are to be noticed, here and there, are usually in a neglected and unproductive state and most likely injured by disease. Indeed it is not to be expected that the cottages of the working classes should be better supplied than the walls of their masters' houses and gardens, to which a healthy Vine is almost equally a stranger. As for the disease to which I allude, it is simply a difficulty to be overcome with very little trouble. It seems to have been unknown until within about 17 or 18 years;* and it affects the Vines in hot-houses and green-houses even more than those upon open walls. The remedy, which is infallible, is sulphur applied in powder to the foliage; and, mixed with soft soap and tobacco ashes, to the whole of the trunk and stems of the trees about the month of March, or in April. These ingredients should be incorporated with hot water to the consistence of paint and applied with a soft brush.

* Edward Tucker, a gardener at Margate, is said to have been the first to notice it, in 1845. It must, I think, have been in that or the following year, I saw the fatal ravages of the disease (*oïdium*) upon a Black Hamburg Vine in the garden of my friend the late Mr. Rolfe, of Sandwich.

I will not run the risk of tiring your patience, or rather of trying it, by a narration of my own experiments on Vines upon the open wall; but I will merely observe they confirm in every respect the statements and opinions of Hoare. I may say, however, what I cannot find that either he or any other writer on the culture of the Vine mentions, that, to save time, it is important to ascertain, when Vines are purchased to be reared upon open walls or to be planted in any open situation, whether the young trees were struck in the open. If not, if they were rooted in a hot house or green house, then they will be checked in their growth for one year certainly; and it may take two or three years before they become acclimatised. It is most essential that all growers of the Vine in the open air should know this.

Next in importance in rural economy come the Cherry and the Plum. Of the first of these I will but mention one variety, the Morello. In speaking of the Vine I excluded it from a northern aspect. In this the Morello delights. Now, that this, the most useful of all Cherries, should always command so high a price is a fact only to be ascribed to that general want of thought which deprives the greater portion of the population of the chance of tasting fruits which nature meant for all. It is, perhaps, the easiest Cherry to rear, as it is by far the most constantly productive. It will bear in the most exposed situations; and, while others fail, it will in all seasons yield a plentiful crop. The rent of cottages might therefore be further helped by the Morello.*

The productiveness of various kinds of the Plum is also but little understood by the thousands who have gardens or courts without a single tree. Mr. Rivers† will tell you what his seedlings, raised from the *Précoce de Tours*, are capable of

---

* The wholesale price is usually from 6d. to 8d. per pound.

† Miniature Fruit Garden, by Thomas Rivers, 9th edition. Longman & Co., 1860.

producing; and he has seen, approved and introduced into his nurseries for the use of the world, our Strood Cluster-Damson, which, from its amazing fecundity, will tend to revolutionise the Damson kingdom. The parent tree of all I have seen was found in the garden of my neighbour, Mr. Herbert, who says it was always worth a pound a year to him. Unlike the common Damson, it scarcely fails to bear enormous crops once in a dozen years; and it would grow even in hedges;* or it could be cultivated as a bush like Gooseberry and Currant trees.

As for the Gooseberry and Currant, they grow almost spontaneously; and are so profitable that a gentleman in this county told me he paid his rent yearly from his currant trees alone! Why, when such trees cost nothing but the labour of planting cuttings, should they not be found in every cottage garden? Thousands upon thousands of cuttings, capable of forming bearing trees in two years, are yearly thrown away in districts where they could be turned to profit without the outlay of a penny.

Let it be understood that a garden *well managed* would not grow a less quantity of vegetables from being properly stocked with fruit trees.

Our chief writers on Horticulture, so far back as Evelyn, strenuously urged the nobility and gentry to improve their estates and their country by planting fruit trees. But if in former times they needed to be reminded and advised, how much more, at the present day, should their serious attention be directed to the subject? I doubt if the plantations of fruit trees in this country exceed those of the time of Charles II. Compare this with the increased population, and we need not wonder that fruit has become an unattainable luxury. Landowners should advise their tenants to plant; they themselves should set the example; and every farmer

* The usual price of Damsons is 12s. per bushel.

should be taught to see that his cottagers' and labourers' gardens be properly stocked. We should go far to exterminate the habits of idleness, drunkenness and improvidence, now so common among the working and lower classes, if we could give them ground for gardens and teach them how to work it. Contrast the neatness and the comforts of the humblest cottage of the industrious labourer, to which a garden is attached, with the usual slovenly and untidy dwellings of those whose masters have land to give; but who want the heart and feeling to give. The tenants of the two classes of dwellings are equally marked in character; and the masters are as truly reflected in their men.

The late Mr. Cobbett, when staying with a friend in the South of England, was being driven by him in his chaise, on a summer evening, along a road unusually studded with labourers' cottages and gardens. The neat state of the dwellings, the flowers in front, and the fruit trees and vegetables behind, drew from the veteran politican warm expressions of admiration and delight. "To whom do they belong?" inquired Cobbett. He was told; "but," added his friend, "they are *Tories*." "Dont tell me," replied Cobbett energetically, "about their being *Tories:* they are damned *good* "men." He meant they were superlatively good; and so, we may hope, the recording angel understood it.

Believe me to be,

My Dear Sir,

Yours sincerely,

C. ROACH SMITH.

Temple Place,
Strood, Kent,
January 15*th*, 1863.

ON THE TYPICAL QUADRUMANA;

WITH ESPECIAL REFERENCE TO ST. HILAIRE'S DIVISION INTO CATARRHINE AND PLATYRRHINE GROUPS.

By Cuthbert Collingwood, M.B., F.L.S., Hon. Sec. to the Liverpool Literary and Philosophical Society &c.

(Read 19th March, 1863.)

The marvellous notions which, even at the present time, possess the minds of the natives of the regions inhabited by the Quadrumana, are easily accounted for, when we recollect that Linnæus himself hesitated as to the true affinities of the higher forms. In the last edition of the Systema Naturæ, which was published during his lifetime, (the twelfth edition, A.D. 1766,) he has considered the *Chimpanzee* as a wild species of man, under the names of "*Homo nocturnus* and *H. "sylvestris*," describing him as "lying concealed during the day, "and going forth during the night; speaking with a hissing "sound; thinking, reasoning, believing that the world was "made for him, and would eventually be restored again to his "sole dominion."* All this, it is true, he states only "on the "authority of numerous travellers," but still it shews the superstitious notions which occupied the minds not only of civilised, but of highly educated men, concerning them,—and that, notwithstanding the fact that Gmelin tells us this species was seen in London in 1738; and it is remarkable that the only alteration made in this last edition is the insertion of the word "ratiocinatur," *i.e.*, he is capable of reasoning.

---

* *Homo nocturnus*, *Homo sylvestris*, Orang Outang, corpus album, incessu erectum, nostro dimidio minus. Pili albi, contortuplicati. Oculi orbiculati, iride, pupillâque aureâ. Palpebræ anticè incumbentes. Die cœcutit, latet. Noctu videt, exit, furatur. Loquitur sibilo; cogitat (ratiocinatur, ed. xij); credit sui caussa factam tellurem, se aliquando iterum fore imperantem, si unquam fide peregrinatoribus multis.—*Linnæi Syst. Nat.*, ed. x. 1758.

But it is not the purpose of this communication to enter upon the controversy concerning the pithecoid origin of man. It is simply alluded to as pointing out the great interest which is ever taken in this class of animals on account of their remarkable approximation in many points to the genus *Homo*.

To render clearer, however, the final object of this paper, it will be necessary, before proceeding further, to take a brief glance at the classification of the Quadrumana.

Before the discovery of the great continent of America, the zoologist might be be said to be yet acquainted with a considerable variety of monkeys, and among them, with many that are *still* the most remarkable of the order. There were the extraordinary Anthropoid Simians, the Chimpanzee, and Orangs, inhabiting the Guinea coast of Africa, and the great islands of the Javan sea; and the Gibbons (Hylobates) or long-armed apes, confined to Eastern India. All these, in addition to their near approach to the human form (in which particular the Chimpanzee, called Troglodytes, after a fabulous Æthiopian race, referred to by Herodotus,* and said to inhabit holes and caves, is pre-eminent), are remarkable for the absence of the tail. This want in the greater part of the group is literally *counterbalanced* by the greater length of the arms, for in all those monkeys which are arboreal in their habits, constituting the major part, the *tail* appears to be a balancing organ, and plays a great part in those feats of agility which call forth the wondering admiration of human beholders. Next to these Primates, as they were called, comes the unique Kahau, or Proboscis monkey (Nasalis), of Borneo, to which the term *Simia* is so inapplicable. There is but one species of this anomalous genus; what was supposed to be another species is most likely the young individual. The remarkable genus, *Semnopithecus*, of F. Cuv., with their slender and agile forms, is exclusively

* Herodotus, iv., 183.

Indian; and this group is completed by the genus *Colobus*, from Africa, which has only four, instead of five fingers, on the anterior extremities. These are all distinguishable from the *first* group by their long tails, and from the *succeeding*, by the absence of cheek pouches. After these come the minute and beautiful Talapoin, the smallest monkey of the old world, inhabiting the west of Africa; and the comprehensive genus *Cercopithecus* (including the genus *Cercocebus*, of Geoffroy), whose strong canines and small facial angle connect them with the *Macaques*, containing no less than twenty-seven species. All these are remarkable for their grace and elegance of form, frequently for their beautiful fur, and for their mild and affectionate disposition. They inhabit Africa and India, and are distinguished from the last group by their ample *cheek-pouches*.

Following these, is the powerful genus *Macacus*, very widely distributed, and occupying a geographical range of three divisions of the globe; the Barbary Ape, or Tailless Magot *(Macacus Inuus)* being found upon the rock of Gibraltar, a solitary European species. This monkey has no tail; neither has it, like the Gibbons, a counterbalancing length of arm. But it must be remembered that this species, in common with most of the group, is *not* arboreal, but lives chiefly among the cliffs and rocky places, where still a considerable, but not an equal amount of agility is required. The Barbary Ape makes the transition easy to the last group of Cynocephalous Baboons, all natives of Africa, including the fierce Chacma and the grotesque Drills, whose prolonged dog-like muzzle, enormous strength, and ferocious disposition, readily distinguish them from all the other Quadrumana.

Such are the monkeys of the Old world; and throughout the whole of these groups, there runs such a general resemblance, that it is evident they belong to the same type, and were formed, so to speak, on the same general plan. But still

it must be remarked, that between this last group and the *Lemuridæ* (which are Quadrumana, but not true monkeys) there is a wide gap. These latter, in addition to their fox-like snout, and general resemblance to the Insectivora, have sharp hooked claws, in the place of flat nails, and are all, more or less, of nocturnal habits. The transition, also, from the almost typical Guenons, or Cercopitheci, to the almost quadruped Cynocephali, is very rapid; and the want of some connecting links would, in the present advanced state of zoological science, have been keenly felt, and perhaps sought for in the geological records of the Pleiocæne era.

But the discovery of the continent of America supplied many links in this chain of beings, by disclosing a race of monkeys so distinct in form, structure, and habits, from those I have briefly referred to, that Geoffroy St. Hilaire speaks thus strongly concerning them.* It may be remarked, that most of the naturalists who have by their labours and writings elucidated this class of animals are French. "It is another "nature of doubtful beings, between man and the carnivora, "another *monkey type*. * * * * It is truly another "type; just as though the monkeys of America belonged to "another epoch of the creation, and as though the species of "the two types had, in their propagation, each retained, in all "their modifications, the fundamental peculiarities of each "primitive system."

Nor is this distinguished philosopher alone in his estimate of the broad distinctions which characterise the two races; and I could quote an equally pointed remark of Professor Owen's,† but further evidence is not called for.

---

* C'est une autre nature d'êtres ambigus entre l'homme et les carnassiers; un autre type singe. * * * * C'est vraiment un autre type, comme si les singes d'Amérique provenaient d'une autre époque de création; et comme si les espèces des deux types se fussent multipliées en retenant dans leurs modifications les traits fondamentaux de chaque système primitif."—*G. St. Hilaire, Cours d'Histoire Nat. des Mammifères. Lect.* 9, *p.* 4.

† Owen, "Odontography," vol. i, p. 439.

Catarrhine

Fig 1

Simia bicolor.

Types.

Platyrrhine

Fig. 2

Cebus hypoleucos.

C.C. delt.

LAWSON LITH. 26 NORTH JOHN ST. LPOOL

I will, therefore, just point out some of the most well-marked characters by which this new type is distinguished from their prototypes of the old world.

First, the size of the facial angle should perhaps be mentioned, although on account of the great variety of this angle in different monkeys, it can scarcely be compared in the two races. This angle, according to Camper, contains 80° in Europeans, and in some negroes which he measured, it only contained 70°. Now, in measuring the skulls of Orangs, Lesson (*Hist. Nat. Mammifères*, vol. iii, p. 230) estimated it at from 60°, even as high as 64°, but Professor Owen has shewn (*Zool. Trans.*, vol. i, p. 372) that Lesson measured only young animals; and states that the facial angle of the adult Chimpanzee is only 35°, while that of the Orang is but 30°. This difference is owing to the immense development of the jaws in the adult Orangs, which is accompanied by a corresponding amount of brutal ferocity, and savage animal propensities. In the Baboons, again, the facial angle is considerably less, and every gradation between these may occur. Among the American monkeys, on the other hand, there are none which so nearly approach man, nor any which are so distant from him in organization, as are found in the old world family. Their heads are generally round, and their muzzles short, so that the facial angle is large, and varies between small limits, being from 55° to 60°; this angle, therefore, cannot be made use of in these monkeys as a character of any importance.

M. Isidore St. Hilaire, the younger, has given, in the *Comptes rendus*, the following general statement of measurements in certain groups :—

	ANGLE FACIAL.
Gibbons et sajous	60 deg.
Cercopithéques	50 „
Magot	40 „
Cynocephales et Hurleurs	30 „

In the second place, the general size of the American type is much smaller than that of the old world monkeys. Thus, a fine specimen of the *Satyrus rufus*, in the British Museum, stands exactly four feet high, and the anterior extremities measure rather more than three feet in length. The height to which the adult Orang attains is scarcely known, but that of the adult Gorilla is not a matter of doubt. Many other of the higher forms are also of considerable size, and the quadruped Baboons are of no mean proportions; but among the monkeys of the new world, the Howlers (Mycetes), which are allied to the Baboons, are perhaps the most robust, and seldom reach three feet in height. The genus Ateles contains the individuals which stand *tallest*, and some in the British Museum reach the height of three feet; but their very slender forms and elongated extremities which contribute to this height, offer a singular contrast to the thickset and robust forms of most of the old world monkeys. An extinct species has been discovered which must have been four feet high, but this is the largest known; and the lowest genera, Midas and Jacchus (usually called Marmozets), are not bigger than squirrels.

Third. In the Quadrumana of the Old world many generic and specific differences depend upon the presence, absence or amount of development of those *tubercular callosities* on the buttocks, which are more or less defined in all the Gibbons, and in most of the Baboons; and on the *cheek-pouches*, which are so ample in all the family of Cercopithecians. Now, these two characters are *unknown* in America; and not a single species of New world monkey is possessed of either.

Fourth. *The tail*, which is not unfrequently altogether absent in the Old world species, is in all the American monkeys (with the exception of two species of a genus which is thence called *Brachyurus*) highly developed; and this not only in its length, which is sometimes extraordinary, but also in its

capabilities as a prehensile organ. For this purpose, the under part of its extremity is bare of hair, and callous; and is capable of being applied as a fifth hand with the utmost precision; which, as those which are possessed of this organ are exclusively arboreal, must be of the greatest service. The strength of the vertebral column, and of the muscles attached to it, reaches, in these monkeys, the highest degree of development, and the excess of power in this one organ results in the greater general strength of those so furnished. The extent of the *callous* part of the tail is in tolerably exact proportion to its powers as a prehensile organ, and is very constant in each species, occupying near one third in the Howlers, and two-fifths in the genus Brachyteles, &c. This very remarkable feature is peculiar to American monkeys, and is possessed by more than half of the whole number of species.

Fifth. They differ as to their *dental formula.* The Quadrumana of the old world possess an array of teeth which is expressed thus—

Inc. $\frac{4}{4}$ Can. $\frac{1-1}{1-1}$ Bicus. $\frac{2-2}{2-2}$ True Mol. $\frac{3-3}{3-3}$

thus agreeing with man in the number of their teeth, but differing widely from him, and from each other, in the development of individual teeth, and dental tubercles. But the monkeys of the new world possess an additional molar tooth on each side of each jaw, which thus gives them thirty-six, instead of thirty-two teeth. In the Marmozets, however, these additional molars are wanting. The significance of such changes as these will be best understood by a reference to Prof. Owen's valuable work on Odontography.

Sixth. Another remarkable point of difference between the Quadrumana of the *old* and *new* continent is, that all the former (including even the family of the Lemurs, which in many respects aberrate widely from the monkey type) possess both on the anterior and posterior extremities an *opposable thumb;* whereas the opposable character of the thumb is,

in the latter, confined to the posterior extremities. This is undoubtedly a character of importance, but by no means such as to justify an attempt at classification upon that character alone. Such an attempt was made about thirty years ago, by Mr. Ogilby, but, as might have been expected, it has never been adopted; and his plan, which may be found in the *Proceedings of the Zoological Society*, 1836, was to arrange all the mammalia which were possessed of opposable thumbs on either extremity, in one order, which he proposed to call *Cheiropoda*, and these again into three sections. The first, having the opposable thumb on the hands only, included *man*, and was called *Bimana*. The second had the characteristic mark on both *hands and feet*, and was called *Quadrumana*, including all the old world monkeys and the Lemuridæ. The third had it on the *feet alone*, and was named *Pedimana*, and included the monkeys of the new world, and another family which indeed possess this character, but which few would be hardy enough to class with Simiæ; I mean the Didelphidæ or Opossums. Thus, in this fantastic arrangement, old and new world monkeys are separated by aberrant Lemurs; and placental and non-placental animals are mixed up in inextricable confusion. Moreover, there is an old world genus (Colobus) which possesses no thumb at all on the anterior extremity; and as such an animal can hardly be said to have the anterior thumb opposable, it must take its place among the *Pedimana* of the new world, far away from its companions of the old.

In the fifth edition of Lyell's Geology, it is stated that no fossil remains of Quadrumana had been discovered, even in the most superficial deposits; but since that time (1837), such remains have been found, both in Asia and in America. Messrs. Cautley and Falconer discovered in the Sewalik Hills of the Himalayan range, fragments of a gigantic Simian, among the bones of other animals; and in the basin of the

Rio des Velhas, in South America, Dr. Lund found the fossil remains of an extinct monkey of larger proportions than any *now* inhabiting that region; but it is not a little worthy of remark, although a fact which might have been anticipated, that both these relics of a former world are found to assimilate respectively with the old and new world types, the Asiatic species being an Entellus, and the American species having probably been a Sapajou.

But beside all these distinctions which I have shewn to exist between the Quadrumana of the New and Old world, there was a seventh, which was remarked by Geoffroy St. Hilaire, and founded upon the form and position of the nostrils in the two races. No *one* of those remarkable characters which I have before referred to, is diagnostic of *all* the Old from *all* the New world Quadrumana; although all of them taken together offer very strong and characteristic points of difference; but the distinction I now allude to was considered to admit of such universal application, that the above eminent naturalist made the basis of his classification the terms *Catarrhini* and *Platyrrhini;* the former including all the monkeys of the old continent, and the latter, all those of the new. The signification of these terms I shall presently explain; and, meantime, I may express my object in the remainder of this communication to be—

1st. To inquire how far the terms Catarrhini and Platyrrhini are applicable to the distinctions they are intended to convey.

2nd. To shew where they appear to me (according to the definitions of them ordinarily accepted) to fail in their application.

3rd. To point out a mode in which I have, by careful comparison, been led to think they may be corrected.

We must let St. Hilaire, himself, explain the terms we have

just used. His exposition will be found in the work before quoted, and is as follows :*

"*Simiæ Catarrhini.* Characters. The nasal septum very "narrow, and the nostrils opened below the nose.

"*Simiæ Platyrrhini.* Characters. The nasal septum broad, "and the nostrils opened upon the sides of the nose."

As far as the position or aspect of the nostrils is concerned, this is suficiently exact; but Latreille gives us more definite information concerning the nasal septum. He says †—

"*Simiæ Catarrhini.* The septum which divides the nostrils, "very narrow (très mince); so that their openings are almost "in contact, and below.

"*Simiæ Platyrrhini.* It is easy to distinguish these from "those of the old world, by the thickness of the septum which "divides their nostrils; a septum as broad, or broader, than "the nostrils, measured in their greatest diameter."

In studying the members of this interesting order, one cannot fail to be struck with the fact that these definitions are defective—that they are too general, and admit of so many exceptions, that it becomes almost necessary to force the rule to meet the exigencies of the examples—a proceeding which every one will admit to be of an extremely illogical and unphilosophical nature. It will be found, for example, that while the majority of the old world Quadrumana possess nasal septa about one-eighth of an inch in thickness, some of them exceed half an inch; and that while, in the new world monkeys, this septum is sometimes nearly three-quarters of

---

* *Singes Catarrhinins.* Caractères. La cloison des narines étroite, et les narines ouvertes au-dessous du nez.

Singes Platyrrhinins. Caractères. La cloison des narines large, et les narines ouvertes sur les côtés du nez.—*Cours de l'Histoire Nat. des Mammifères.*

† *Singes Catarrhinins.* La cloison qui sépare les narines tres mince, de sorte que leurs ouvertures sont presque contigues et inférieures.

Singes Platyrrhinins. Il est facile de les distinguer de ceux de l'ancien continent, à l'épaissur de la cloison qui sépare leurs narines—cloison aussi large ou plus, que les narines mesurées dans leur plus grand diamètre.—*Latreille, Hist. Nat. des Singes.* Paris, an ix.

an inch in thickness, it in some instances barely exceeds one-eighth of an inch. It is true that, in a very short time, it becomes evident that the two races are very distinct from one another in general appearance; and that the ensemble of a new world monkey, as distinguished from those of the old world, is so peculiar and characteristic that the student is soon enabled to throw aside Geoffroy's law, in a great measure —*not*, however, as *unimportant*, for the more the order is studied, the more valuable is the *principle* perceived to be, although it appears desirable to make an alteration in the expression of it.

The shape of the nasal apertures varies considerably in various genera of monkeys, as may be easily seen on an inspection of any well prepared collection. Such an one, especially, is that beautiful series of these animals at the Museum of the Jardin des Plantes at Paris; a collection, however, as I am informed by Dr. Gray, considerably inferior in richness to our own collection in the British Museum, which, ten years since, contained thirty more species.

The openings of the nostrils of the anthropoid Simians are often narrow, and present an appearance during life as though they had been flattened or beaten in by violence. The anomalous genus Nasalis I have before mentioned. In it, the nose is exceedingly prominent; but the septum is certainly "très mince." Thus, in a fine specimen of this animal in the British Museum the nose projects $2\frac{3}{8}$ inches beyond the lips; and a straight line drawn from between the eyes to the tip of the nose measures 4 inches. The breadth of this organ is $1\frac{1}{8}$ inch; "but a stuffed specimen cannot give one an adequate "idea of the natural appearance." (Broderip.)

The Colobi I shall refer to more particularly presently. In the Semnopitheci and Cercopitheci the form and position of the nose is something intermediate between the Orangs and the Proboscis monkey, and indeed if a young specimen of the

latter animal be examined, it will be found that its nose is like the same organ in an adult Cercopithec, only a little exaggerated. In most of the Cynocephali, the nostrils are truly terminal; they project beyond the muzzle and are generally nearly triangular in form, and have a very narrow septum. In the Mandrill they are nearly round, whereas in the allied genus, *Theropithecus* (or Gelada) they are flat and simian, and situated far back, instead of being terminal; the muzzle terminating an inch beyond them in a clavate form. Among the new world monkeys there is not so much variety, and where it *does* occur, since that variation is favourable to the ideas I am endeavouring to set forth, I shall refer to them specially in their proper places.

A few words concerning the Osteology of this part of the Quadrumanous skull may not be uninteresting. The opening left by the superior maxillary bones is, in some instances, just the reverse of the same opening in the human skull; and the anterior nasal spine is wanting, there being a groove in its place. The nasal bone is generally in the same plane as the interorbital plate, and is there usually only one. The ascending or nasal portion of the superior maxillary bone, which is of greater proportional size than in the human subject, does not ascend vertically to the orbits, as in man and some of the lower Quadrumana, but slopes backwards as in the Cynocephali, and in the carnivorous mammalia, though in a less degree. A character by which the Chimpanzee approximates more closely than the Orang to the human subject, is presented (according to Vrolik) by the nasal bone, which projects in a slightly arched form beyond the interorbital plane, while a trace of its original separation into two lateral elements remains at the lower margin of the consolidated and single bone. In the American monkeys the division is often evident, and indeed there is considerable general resemblance

Fig. 3.

Eriodes hemidactylus.

Fig. 4

Fig. 5

Colobus Guereza.

Fig. 6.

C.C. delt.

J. LAWSON, LITH. 26 NORTH JOHN ST. LPOOL.

in the skull of Cebus to the human skull, a resemblance which is still more striking in the Marmozets.

In the enunciation of Geoffroy's law as above given by himself, there are two elements, which must be examined separately. We will first take that one which I conceive to be the less important of the two, because it is not involved in the terms I have before mentioned; which may be thus stated:—that the apertures of the nostrils of monkeys belonging to the old world are *below* the nose, ("au dessous du "nez,"—St. Hil.; "inférieures,"—Latreille); while those of the monkeys of the new world are lateral ("ouvertes sur les "côtés du nez." St. Hil.) Now I think that if, on a fair profile view of any monkey, the whole opening of the nostril can be seen in its full circumference, without foreshortening, that opening cannot be said to be otherwise than *lateral;* for if it might be otherwise considered, that character would become valueless as a differential sign. It being granted then, that such a nostril has a right to be considered *lateral,* let us next see whether this lateral nostril is confined to the monkeys of the new world, and whether indeed it be constant among *them.*

I do not hesitate to say that the description of a lateral nostril above given applies, not to the new world Quadrumana alone, but also to many of those of the old world. I might instance several of the Semmopitheci, in which the whole nostril is seen on a side view, especially S. Siamensis. Of the genus Colobus are some well-marked examples, especially the Guereza (C. Guereza), in which we may absolutely distinguish a larger aperture in the nostrils on a side view than on any other aspect (fig. 6); and in some of the Cercopitheci the character is only less marked. The Magot (Macacus Inuus) discloses the full size of his nostrils on a profile view; and I think, the terminal nostrils of the Cynocephalous baboons might be considered as negative evidence against the applicability of the "narines

"inférieures," of Latreille and St. Hilaire to the Old world monkeys. Indeed, when taken strictly, the only monkey which I can understand as having nostrils opening "au dessous du nez," is the Proboscis monkey (Nasalis larvatus); and some, as the Chimpanzee, for example, I should be more inclined to call "au dessus," or "supérieures," for they open *upwards* rather than in any other direction.

But not only do some of the Old world monkeys possess lateral nostrils, but certain New world monkeys have them opening to the front. I admit that in those Platyrrhini in which the nostrils *do* open to the side (as Cebus hypoleucos) and which constitute the majority, the lateral opening is more decided than in any old-world monkey whatever, but there are exceptions. These are certain species of the genus Ateles, for instance, A. Beelzebuth, and all the genus Eriodes (fig. 4). In none of these can anything like a full view of the opening of the nostrils be obtained on a profile aspect. Indeed, of the genus Eriodes, containing three species, a late work on the Quadrumana says:* "They have the nostrils opening in-"feriorly," thus allowing at least one exceptional genus.

We will now examine the other, and more important element of distinction; and the one which has given rise to the names Catarrhini and Platyrrhini; viz., the *size* of the nasal septum, which is said to be *narrow* in the old world, and *wide* in the new world monkeys.

The nasal septum of some of the genus Colobus is as wide as many, and wider than some of the Platyrrhine group, and this is especially apparent in the Guereza (C. Guereza) (fig. 5) which I have before mentioned as having the nostrils opening laterally. The septum here measures half an inch in width; and it is scarcely less apparent in the Colobus ursinus. In many of the Cercopitheci, it is far above the average width, as for

* Ils ont les narines ouvertes inférieurement—*Chenu, Hist. des Quadrumanes*, p. 197.

example, in C. cynosurus and C. samango. Among the new world monkeys, where we are taught to look for very wide septa, I may again instance the genera Ateles and Eriodes (fig. 3) as exceptional; and, indeed, I believe that in the first and most typical group of American monkeys (the Sapajous) the nostrils are, as a rule, situated more close together than in the second and third, or more aberrant, groups, the insectivorous Geopithecs, and the rodent Marmozets. In Ateles Beelzebuth, it is not so wide as in many Catarrhini, and the genus Eriodes (Brachyteles) is confessedly exceptional in this, as well as in other particulars. Thus in the work last quoted, we read—"Eriodes. Nostrils rounded, very close together (très rappro-"chées), and rather inferior than lateral; nasal septum very "slightly thickened;"* and in explanation of this misfortune we read further †—"The genus Eriodes is very remarkable, and "seems to establish the transition from the monkeys of the old "to those of the new world; they have the nostrils opening "inferiorly, but all the other characters class them among "American monkeys;" and indeed this septum of Brachyteles hypoxanthus is only one-eighth of an inch in thickness. Of the genus Nyctipithecus also it is said ‡—Nostrils separated by a very narrow septum, and opened sometimes on the side, and at the same time below the nose.

Here, then, we have a genus which in every other respect resembles the Platyrrhini, but in this important one, on which the distinctive name is founded, they are exceptional.

So much for instances; and having such before us, it cannot be matter of surprise that Sir Wm. Jardine,§ when speaking of the new world monkeys, in a popular work, has

* Narines arrondies, très rapprochées l'une de l'autre, et plutôt inférieures que latérales, cloison nasale très peu épaissie.—*Chenu*, p. 197.

† Les Eriodes sont très remarquables, et semblent établir le passage des singes de l'ancien continent a ceux du nouveau monde; ils ont les narines ouvertes inférieurement, mais tous les autres caractères les classent parmi les singes Américains.—*Op. cit. p.* 197.

‡ *Op. cit.* p. 224. § Naturalist's Library vol. i, Mammalia, p. 162.

omitted to include the nasal characters among the "most striking outward differences."

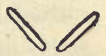
And here let me not be thought presumptuous or captious in finding fault with what has now so long been current and unquestioned. I do not by these observations intend to infer that a character franked with the name of St. Hilaire, and subscribed to by so many eminent naturalists, is, after what I have said, *valueless*. On the contrary, I believe that the terms Catarrhini and Platyrrhini are of great significance to one well acquainted with the Quadrumanous types, and who does not require to make these distinctions a stepping-stone to such an acquaintance. I even grant that the Guereza, a Catarrhine monkey, which, nevertheless, has lateral nostrils and a wide septum—both characters belonging to the other group—is nevertheless very distinct from that other group, even in those very characters which it has in common with it; and this paradoxical remark can only be fully understood by one who is acquainted with the typical characters of the two groups; although I hope before I conclude to render it less obscure.

It appears to me that correctness of description demands that the far too general expositions of the terms applied to the two great families of monkeys by the eminent French naturalist should be revised and qualified to meet the numerous exceptions to which I have referred.

Having, then, pointed out the defects of the *definitions* of the terms Catarrhini and Platyrrhini, and shown that, important as those terms are, the characters ranked under them are not constant,—it may be asked: If there is so much significance in these terms, is it not possible to discover some character which *is* constant and peculiar to both—some invariable mark by which the mere tyro could at once pronounce the native soil of any one of these animals, whether in the new or the old world? My answer is that, believing from the very nature of things

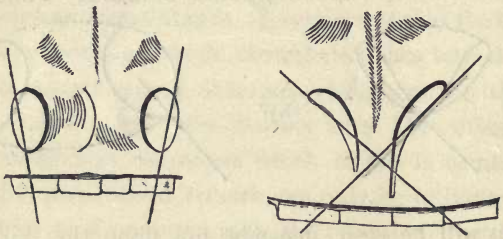
that such a character might be found, I sought for it with care and diligence, and I think I may say I *have* found a character, equally simple and invariable, which, accurately enunciated, amounts to this :—*If the lower angle of each nostril be bisected, the imaginary lines bisecting these angles will, in the Catarrhini, rapidly con*verge *below, until they meet in the mesial plane of the lip ; whereas, in the Platyrrhini, the same lines will di*verge *from the mesial plain ;*—or, to state the same facts in a general way :—*The lower angle of the nostril of an* Old *world monkey points* in*ward, while that of a* New *world Monkey points* out*ward.* Thus—

This, it will be seen, depends, not upon the thickness of the septum, which, as we have remarked, is a variable character, but upon its form, which is pyramidal in the Catarrhini, and of a contracted or hour-glass shape in the Platyrrhine group.

Thus, in the typical Catarrhine monkeys (fig. 1) the nostrils are linear, and almost meet in their inferior angles  It will not be necessary, however, to carry the illustration all through the two families, but only that I should show that in those monkeys of both families which most obviously aberrate from the descriptions given by St. Hilaire, the character here given obtains to perfection. Thus, in the genus Colobus, (figs. 5 & 6) in which, though a Catarrhine monkey, the septum is so wide, the inferior angles will be seen to converge rapidly ; while in the genus Brachyteles (Eriodes), (fig. 3) although the septum only measures $\frac{1}{8}$ of an inch in width, its peculiar Platyrrhine form causes these lower angles

to diverge from each other. These characters, in fact, I have no doubt, from my observation of the specimens in the British Museum and Jardin des Plantes, are universal, and independent of the size of the septum and of the aspect of the nostrils.

In conclusion, I may remark that, thinking it possible that some writer should have seized upon this character, from whom I might be suspected to have copied it, I searched a great number of works on the Quadrumana, but failed in discovering anything more than this, which is a vignette, or tail-piece, copied from Audibert's beautiful work :—



What this means, whether any perception of the character I have endeavoured to set forth, I know not. Audibert gives the diagram with no explanation of it whatever that I was ever able to discover; and I shall therefore leave it, as he has done, without further remark.

POPULAR RHYMES AND PROVERBS CONNECTED WITH LOCALITIES.

Second Series.

By A. Craig Gibson, F.S.A., Hon. Curator.

(Read 12th March, 1863.)

This paper is another contribution to a more comprehensive gathering up of the folklore of the country than has been effected hitherto; that of one of the two counties to which the operations of this Society are chiefly dedicated having been treated of very ably and thoroughly, in its Transactions, by Mr. Wilkinson.

In a former essay I gave, and remarked upon severally, a collection of the scraps of rhyme and old bye-sayings that are popular and current in a district immediately south of the Scottish frontier. In this I propose to offer, and again to remark upon and illustrate, a series of similar remains, gathered from a tract immediately north of that line, and forming, prior to the union of the two countries, a portion of what was called the Western Marches; in our own times, the central division of the fair county of Dumfries.

An old English ballad describes the North as the country where "every river gives name to a dale;" and, in accordance with that pretty constant rule, Dumfriesshire is divided into three Dales or Stewartries, called, after its principal streams, Nithsdale, Annandale and Eskdale, all abounding in natural beauty, famous in story and song, and rich in traditional romance and historic interest. The district from which I glean my materials is that watered by and named after the

river Annan, which rises in a wild and deep recess in the south Highlands, known locally as the "De'il's Beef-tub," and, after a winding and varied course of some forty miles, runs into the Solway Firth near to the ancient royal burgh, also called Annan, passing, on its way, many an ancient fortalice and many a storied field.

The first old rhyme on my list is one in which this river figures, along with some of its neighbours, and of which an imperfect version has been published by Mr. R. Chambers, in his extensive collection of local rhymes.

"*Annan, Evan, Tweed and Clyde,*
"*A' rin out o' ae hillside.*"

Much cannot be said for the topographical accuracy of this well-known scrap. The four rivers might have been described more correctly as running out of different sides of the same hill; but, like the real name of the man who in his epitaph had to be called Dunn, to provide a rhyme to the weapon that killed him, such proper description would not meet the requirements of the rhyme—and "monarchs are less impera-" tive than rhymes." Three of these rivers, in another equally popular jingle, are represented as running a race to the sea, thus:

"*Tweed ran;*
"*Annan wan;*
"*Clyde fell and broke his neck owre Corra Linn.*"

The metaphorical disaster of Clyde refers to one of the beautiful falls made by that river in its course. The success of Annan is attributable to the Solway being nearer to the starting point than the German Ocean, to which Tweed runs, on the east, or the Atlantic, which receives Clyde, on the west.

Like most mountain-bred streams, Annan is subject to heavy floods; and, though the rich alluvial holms along its borders are now protected by sufficient embankments, those familiar with the natural features of Annandale can readily conceive the disastrous effects of such freshets upon the

unprotected fields, and will recognize the probable truth of the old saying—

" When Annan roars o'er bank and brae,
" The Southland farmer's heart is wae."

These ancient relics, besides their popular interest, illustrate the curiously respectful manner in which the Scotch Lowlander, as well as the English Borderer, speaks of his native rivers, indicating them as though they were impersonations of some vague power; rarely prefixing to their names the definite article, as the English in general do in speaking of *the* Mersey, *the* Dee, *the* Severn, and so on, but calling them Tweed, Yarrow, Ettrick, &c.; while the people residing in a district watered by any particular stream, call their district, and even themselves, as well as the river, " The Water," and are so spoken of by their neighbours, occasionally with the name of the river appended—a custom that gives rise to expressions somewhat puzzling to the Southron. Thus, I have heard it said of a large assemblage of country people, that " A' Corrie " water was there;" and at a fair I have heard a quarrelsome rustic assert that he " could thrash a' the Water o' Milk," meaning, of course, not the rivers so called (the latter the most lovely of all the fair tributaries of Annan water), but the tracts of country drained by the Corrie and the Milk. Again, at an old-fashioned Scotch wedding it has been said of an active young votaress of Terpsichore—activity being of more account there than grace—that " she capped the Water " at dancing:" that was, she surpassed all the people living near it.

There is an old enumerative rhyme on places in the vale of Corrie to this effect—

" There's Corrie-lea, and Corrie-law,
" Corrie-hill and Corrie-ha',
" Corrie-mains, where moudies hork,
" Corrie-common, Corrie kirk."

Corrie kirk, I may mention, has long been disused as a place of worship—the parish being annexed to that of Hutton adjacent.

Again, the old distich—

"Up Corrie and down Dryfe,
"That's the gate to seek a wife—"

was probably suggested to its author by the rhyme, for rhymes often suggest ideas, and I am not aware of any special superiority possessed by the ladies residing on those streams over their fair compatriots. It also illustrates the local habit of referring to the direction of a journey as relative to the course of a river.

The second of these two last-mentioned tributaries of Annan, which gives its name to the parish of Dryfesdale, is, beyond all its compeers, noted for sudden and destructive floods and for being the favourite resort of supernatural visitants. It is perhaps the only river in the kingdom that possesses the ugly distinction of having carried away a parish church. But as it was done in fulfilment of an old prophecy, attributed to true Thomas the Rhymer, we may assume that Dryfe was but carrying out its destiny when it swept away the old kirk of Dryfesdale. The prophecy, still quoted in the vicinity, ran thus :—

"Let spades and shools do what they may,
"Dryfe will ha'e Dry'sdale kirk away."

That spades and shovels were put into requisition to hinder Dryfe of its sacrilegious will, is proved by a case preserved in "Pitcairn's Criminal Trials," where we find that William Johnstone, the Laird of Lockerbie, whose feudal residence, in the usual form of a rude square tower, is still to be seen, in good preservation, standing in the town of that name, was, with his two sons, his brother, seven other Johnstones and several Bells, Chalmerses, Hallidays, Kennedies and Harknesses, on the 14th of January, 1617, "Dilaitit of airt and

"pairt of the slauchter of umquhile James Johnnestoun, in "Kirktoune." The accused, in their defence, state, amongst other matters, that "My Lord of St. Androis that now is, "being Archebischope of Glasgow for the tyme, haiving ane "cair to haif the haill Kirkis within his dyocie sufficiently "plantit: and, efter vizitatioun, cuming to the Kirk of Drys-"daill, where it was fund be him that the watter of Dryfe ran "sa violentlie, efter ane speat, throw the haill kirk-yaird and "landis adjacent theirto, that the Kirk it Selff was likely to "becum ruinous and decay, except the course of the said "watter had been divertit and drawen ane uther way thairfra. "For remeid quhairof, it was agreit, with consent of the haill "gentilmen of the parochin, that the said watter should be "divertit ane uther way; and accoirding thairto it was ap-"pointit that upone the said 25th day of April, the said "William Johnstoun, with the assistance of the parochin, "ssould cum, with spaidis and schules to make ane watter "gang; in the doing quhairof, the said umquhile James "Johnstoun with his sones, cam bodin of weir, and made "interruption to the persouns foirsaidis, that war castin' the "said watter gang, and invaidit and persewit dyuers of the "persones that were working, for their slauchter; be occasion "of the quilk persute and invasion, ane strake was gevin to "said umquhile James upon the heid with ane spaid or schule, "be quhat person the pannell knowis nocht." This extract, as well as the remainder of the defence,* affords a very curious glimpse of the state of society on the Border at that period.

Notwithstanding all the efforts made to avert it, the ancient church underwent its fate, as fore-doomed, in 1670. In the following year a new church was built at the same spot. This was also swept away, and then the present parish church was erected in Lockerbie, a long Scotch mile away from the river.

---

* Given in the *Annandale Herald*—local newspaper.

No trace remains of the old kirk save a portion of its burial-ground, almost hidden by growing timber, but shewing the ancient enclosed burial-places of the Johnstones of Lockerbie, from whom the Douglases of Queensberry and of Lockerbie descend maternally, and of the Herrieses of Halldykes, the recent progenitors of the well-known London bankers and the former Chancellor of the Exchequer of that name. The old churchyard adjoins the great road from Carlisle to Glasgow, just before it crosses the stream. Many ghastly stories were wont to be told of the sights seen about it. It is an "eerie" place to pass in the night time, as I could once testify, and has, in all probability, mainly contributed to give the river its well-known designation of "*Hauntit Dryfe.*"

The flat ground, a short distance below the old kirkyard, was the scene of the famous battle of Dryfe sands, fought between the Maxwells and Johnstones, about the beginning of the 17th century— the last great fight that occurred in the Scottish Marches. Of the sanguinary feud of which this murderous affray was but one incident, the history is pretty fully given in Sir Walter Scott's notes to the ballad of "Lord Maxwell's Goodnight"—the hero of that beautiful old lament being son and successor to the leader who lost the day and was slain at Dryfe sands, with three-fourths of his followers, consisting of men of his own name and of the other clans of Nithsdale.*

Another of these incidents, preceding the invasion of Annandale by the men of Nith, may be noticed briefly, as an illustration of the character of the times and the ferocity with which these quarrels, the effects of feudal hatred and jealousy, were carried out. A party of Maxwells, stationed at the ancient borough of Lochmaben, were surprised by a party of their enemies, the Johnstones of Annandale, and retreated into the church—there defending themselves. The John-

* See p. 177—Note A.

stones, to make short work of the siege, collected all the combustibles within reach, heaped them round the church and burned the sacred building and those within it in one conflagration. The savage nature evinced in this horrible prelude was equally manifested in the battle. No quarter was given, and of the 2,000 men, led by Lord Maxwell, only 500 escaped. Many were slain in the flight—those left wounded on the field being afterwards murdered at leisure. Such killed and wounded were for the most part fearfully slashed across the face, which description of wound was inflicted by a back-handed sword-stroke, for which the Johnstones were noted; and that stroke forms my reason for noticing this sanguinary affair—for, ever since, a back-handed blow has been known on the Border proverbially as "*A Lockerbie "lick.*"

Sir Walter Scott says—"Lord Maxwell, a tall man and "heavily armed, was struck from his horse in the flight and "cruelly slain, after the hand he had stretched out for quarter "had been severed from his body." This has probably been suggested partly by a verse in the "Goodnight."

"Adieu, Drumlanrig, false wert aye,
"And Closeburn in a band;
"And the Laird o' Lag, frae my father that fled,
"When the Johnstone struck off his hand."

Neither the ballad, however, nor its great annotator, is supported by popular tradition; for, in the neighbourhood of the battle-field, it has always been related that the defeated chieftain underwent a still more miserable doom;—that, when his army was routed, he was left wounded on the battle-ground—found there by Dame Johnstone of Kirkton (wife, probably, of the worthy that interrupted the efforts of his neighbours to save the church), who, with her cummers, had resorted thither, probably, in quest of plunder, and by her killed outright with the key of her husband's tower, which stood close at hand; an unlikely

weapon we should now say, but it is well known that the keys of these Border holds were of quite sufficient magnitude for such a deed. Until lately a large old thorn tree, well known as "Maxwell's thorn," marked the spot where this atrocity was perpetrated; but, much to my regret, when I visited the ground, in 1861, it had disappeared, having, in all probability, been carried off, like the church, by the insatiable stream.

The clan that won the victory at Dryfe sands has been located in Annandale from an unknown date, and probably took its surname from the parish of Johnstone, which lies along the west side of the Annan, below Moffat, and which boasts, or lately boasted, that it has within its limits no lawyer, no doctor, no dissenting place of worship, and no public house —without doubt a very enviable list of immunities.

The Johnstones were distinguished along the Border as "*The gentle Johnstones;*" and their vaunted antiquity, their numbers and prosperity have given rise to the following quatrain:—

"*Within the bounds of Annandale*
"*The gentle Johnstones ride;*
"*A thousand years they have been there,*
"*And a thousand years they'll bide.*"

It is hardly necessary to state that the epithet "gentle" here need not be taken in its modern acception. Their true character in "the old riding times," as well as that of a neighbouring clan, may be gathered from the rhyme often quoted in their own district:—

"*Ca', cuddie, ca'—*
"*The Johnstones and the Jardines ride thieves a'.*"*

Occasionally varied thus—

"*The Johnstones and the Jardines rin away wi' a'.*"

Strongly suggestive, too, is the often-cited rejoinder of the old Lockerbie wife to the remark of the beggar, who, after vainly soliciting alms between the town head and the town

* See p. 178—Note B.

foot, exclaimed—"I'm thinking there's nae Christians i' "Lockerbie!" — "'Deed no! We're a' Johnstones and "Jardines here!" Sir Walter Scott, after quoting a less racy version of this anecdote, says that the reply bore reference to the family called Christian, located in Cumberland. There can be no doubt, however, that it was given in all good faith as the speaker's conviction of the absence of compatibility between the Christian character and that of the names in question. The Christians, a Manx more than a Cumbrian family, were never heard of as a name at Lockerbie, and the good people there have always told the story as showing the state of society from which they have so happily emerged.

Of the domestic condition of these Johnstones and Jardines, as indicated in their hotel accommodation some century later than Dryfe sands, we have an amusing glimpse in the journal of an English traveller, who passed a night at Lockerbie, in 1704, and described his lodging thus:—"The room wherein "I was to lay was overflown with water, so that the people "layd heaps of turf for me to tread upon, to gett from the door "to the fire-place and from thence to the bed; and the floor "was so worn in holes, that, had I tredd aside a turfe, I might "have sunk up to my knees in mudd and water; and no better "room was to be had in this town. Nay, what was worse, "my room had but half a door, and that to the street; and "the wall was broken down at the gable, so that my room lay "open to the stable. . . And yet these people had French "wine, though it was spoiled for want of being properly "cellared."

One of those verses that we find connected with many other places, suggested by the symphony of steeple and people, exists here and, besides affording a glance at the sanitary condition of old Lockerbie, shows that the good folk there, in their former condition, held in proper appreciation

that very Scottish proverb—"The clartier the cosier." It runs as follows:—

"*Lockerbie's a dirty place:*
"*A kirk without a steeple;*
"*A midden-hole at ilka door;*
"*But a canty set o' people.*"*

Without doubt the old folk at Lockerbie possessed the happy faculty of being "contented wi' little and canty wi' "mair;" for the proverbial Lockerbie fairing—"*a bawbee "bap and a bottle o' yill,*" (that is, a halfpenny roll and a bottle of beer)--would lead us to infer that where these, to Englishmen always ordinary viands, were a holiday treat, the every-day fare must have been homely indeed.

Times have changed, and place and people have altered with them. The fairings at Lockerbie are more in accordance with the luxury of modern times; midden-holes have ceased to be right things in wrong places; the inns in that prosperous and tidy little town are quite equal to those in any place of its class; that there are Christians there and thereabout has been recently proved by a noble contribution to the distress fund; the chief of one of their thieving clans is Sir William Jardine, the distinguished naturalist; and the present Johnstone of Annandale, who has claimed but not established his right to the Marquisate and Earldom once held by the family, besides representing the chief of the merciless sept that won the day at Dryfe sands, represents also the county in the English Parliament as doucely as

---

* I have given elsewhere one of these "steeple and people" rhymes, connected with Bowness on Windermere. The Rev. Dr. Hume informs me of one referring to Dromore, in Ireland—a venerable little town, that was the seat of a Bishop, from the early date of 556 down to 1848. The distich runs thus—

"High church—low steeple;
"Dirty town and proud people."

Mr. Randleson of Whitehaven has communicated another, which he says was once posted on the door of a church near Carlisle:—

"Low church—high steeple;
"Drunken priest and wicked people."

though his forefathers had been orderly and well conducted as those of any honourable member there.

It was customary with old people when they wished to express their opinion that the means employed for the attainment of any proposed end were inadequate to the object in view, to quote a couplet to the following effect—

"*Andrew Macvitie, that lived at the Quaas,*
"*Had a rusty auld pistol to shoot at the craws.*"

The places that rejoice in this euphonious appellation are a number of scattered houses, cottages and small farms, occupying what was once the common or town-moor of the little municipality I have named so often.

A verse asserting the old forest-like condition of the country and the extent of territory once possessed by another Border name, was frequently heard formerly. I have not got this accurately, but the following is the gist of it:—

"*Frae Annan-fit to Errick-stane,*
"*Men and horse lang syne hae gane*
"*'Neth greenwood gay—and a' the way*
"*Upon the lands o' Halliday!*"

Though the Hallidays do not figure prominently in Border history, it is probable, that in its pre-historic period, which is not very distant, say before the time of Edward I, they were an important sept, and held large possessions. It may be remembered by the readers of old romance, that "Wallace "wight," to whom, the foremost of all her many heroes, Scotland is but now erecting a monument, apostrophizes one of the name as "Tam Halliday—my sister's son so dear." For the last five centuries, however, their star has paled before that of the two leading clans.

One of the rhymes I have quoted commences like that originated by a famous Robin Goodfellow, known as "the "Brownie of Bodsbeck," whose gratuitous services, similar to those of Milton's "lubber-fiend," were given nightly and for

a long period, at a lonely farm in Moffatdale, and were transferred to one adjacent, on the tender of some affronting remuneration. The departure of the good spirit being announced by itself, thus—

"*Ca! Cuddie, Ca!*

"*A' the luck o' Bodsbeck's away to Leithen ha'.*"

As the history of this Brownie and his rhyme is given very fully by Chambers, and the Ettrick Shepherd has made it the subject of a story filling two volumes, it is unnecessary for me to dwell upon it further than to signify that Hogg deprives the Brownie of his supernatural character, making him out to have been a party of Covenanters, hiding in that wild locality, and supplied with food in secret by the farmer's daughter. Of course such an attack on a cherished belief excited, at the time it appeared, considerable indignation, and did not at all impair the popularity of the well-known couplet just given.

The beautiful little watering place of Moffat, the prettiest perhaps of all the small towns of Scotland, has one or two proverbial sayings attached to it. Some of these are scarcely fit to be quoted here. The following, however, is both quotable and complimentary:—"*Moffat measure,—fu' and running ow'r.*" If applied to the allowance served out of the evil-smelling mineral water that has given the place its prosperity, some may consider the compliment it implies rather questionable. A school-boy riddle has been localized at Moffat, and though not a proverb, it may take its place here as a popular rhyme referring to a specified place:—

"*It is in every mountain, it's not in every hill;*

"*It's once in Moffat-water, and twice in Moffat-mill.*"

In the times of the Covenant, to which the people of Lowland Scotland still recur with a just and laudable pride, one of the minor persecutors was a certain laird of Elshieshields, a small estate near to the royal borough of Lochmaben. Some

Whiggish rhymster of the period has taken his revenge on this worthy by embalming his memory in the lines still extant :—

" The wicket Laird o' Elshieshields,
" Has left Lochmaben's pleasant fields,
" And a' her lochs and a' her eels,
" To gang and sup wi' horned deils.
" Gude preserve us a!"

The venerable little town mentioned here occupies a beautiful site, central to the wide vale of Annandale. Surrounded by eight small sheets of water, it bears the popular sobriquet of *" Marjory o' the monie lochs,"* which Christopher North says should be applied to Scotland in general, and under which, Lochmaben figures, along with its neighbour boroughs in Burns's Election ballads. As all the nicknames in those productions were probably, and some of them were certainly, in existence in days long anterior to the time of their great laureate, I may be excused for quoting the passage in which he has celebrated them all :—

Dumfries is personified as—

" Maggy by the banks o' Nith,
" A dame wi' pride eneugh."

Lochmaben as—

" Marjory o' the monie lochs,
" A carline auld and teugh."

Annan as—

" Blinkin' Bess o' Annandale,
" That dwelt by Solway side."

Kirkcudbright as—

" Whiskey Jean that took her gill,
" In Galloway sae wide."

and Sanquhar as—

" Black Joan frae Crichton-peel
" O' gipsey kith an' kin ;—

"Five wighter carlins werena found,
"The south countrie within."

A summary of the topography and characteristics of five towns unequalled for terseness and aptitude.

A brother of one of the members for Liverpool now sits in the British Parliament for these old boroughs. How they were represented in the Scottish Parliament, when each had a member of its own, we may infer from the account of a traveller, previous to the union, who, at Annan found that the landlord of the principal inn was waiter and ostler to his own establishment, was chief magistrate of the borough, and also represented it in parliament. I have heard that the officer of the House of Commons who calls over the names of the members and of the places they sit for was formerly, perhaps still is, in the habit of mis-pronouncing the names of all the five boroughs of the district, thus—"Dùmfries, Annàn, Kirkcud-"bright, Sancuehàr, and Lotchmabèn."

One or two curious sarcastic proverbs connect themselves with Lochmaben. Thus, of a person who sorns (*anglice*, sponges) upon his neighbours generally, it is said—"*He gangs "frae house to house, like the gousting bane o' Lochmaben.*" This "gousting bane" was the bone of a dried joint of meat, of peculiarly high flavour, which, as averred in the district, was passed round the town, when meat was scarce, to impart its taste or "goust" to the several pots of broth in course of preparation. Again, when in England a man would be said to "crow loudly on his own dunghill," in Annandale, it is said—"*He barks wi his back at the hauld, like the dogs o' "Lochmaben,*" that is, he boasts or theatens with a hold or place of retreat near at hand.

One of those enumerative rhymes that are of such frequent occurrence in many parts gives the names of six places in the parish of Lochmaben—

" The Hartwood, the Carthet,
" The Cocket-hill-brae ;
" The Bush and the Sma'holm,
" And the clarty Hightae."

The clachan qualified by this Scottish adjective is the principal member of the little confederacy, called " The four " toons o' Lochmaben." For a curious account of the inhabitants of those places, I must again refer you to Sir Walter Scott's Minstrelsy of the Border, where, in his notes to the ballad of " The Lochmaben Harper," the peculiar privileges and tenures of " The King's kindly tenants," or " The King's " rentallers " as they are called, are explained fully and pleasantly.

The ruins of Lochmaben castle, the family seat of the Bruces, Lords of Annandale, a line that gave to Scotland her greatest monarch, occupy a peninsula running into one of the lakelets—and what remains of them forms a monument of the lingering Vandalism of the neighbourhood ; for, in the words of a local chronicler, " they have served as a quarry to gene- " rations—all the outer and inner surfaces of the walls are " gone, leaving only the strongly cemented rubble work ; they " have supplied stone for numerous farm buildings and many " houses in the town, including the new school built in " 18—." This castle with its outworks, covered a space of sixteen acres, and was the strongest fortress on the borders. In Bellenden's translation of Hector Boece, we find a curious passage relating to it, and to the people around. " In " Annandail is ane loch namit Lochmaben, fyve miles in " length and four of breid,* full of uncouth fische. Besyde " this loch is ane castel under the same name, maid to dant " the incursions of theuis. For nocht allanerlie in Annandail, " bot in all the dalis afore rehersit ar mony strang and wicket " theuis inuadin the cuntre with perpetuall thift, reif, and

* A huge exaggeration.

" slauchter, when they see onie trublus tyme. Thir theuis " (because they heve Inglismen thair perpetuall enymes lyand " dry march apon thair nixt bordour) inuadis Ingland with " continual weris, or ells with quiet thift; and leiffs aye ane " pure and miserabile lyfe. In the tyme of peece they are so " accustomed with thift, that they can nocht desist, but inuadis " the cuntre with ilhand herschippis." Of the still earlier inhabitants, the venerable historian, says " they abhorrit nocht " to eit the flesche of yelding prisoneris. The wyvis usit to " slay thair husbands when thay wer found cowartis or dis- " comfist be thair enymes to give occasion to others to be " more bold and hardy when danger occurrit." This seems to forestall Voltaire's famous sarcasm that the English shot Admiral Byng to encourage the others.

When witchcraft was rife in Scotland, (and some hold that it is not eradicated even now,) the preparation of food was one of the domestic processes often impeded or marred by spell and incantation. The vagaries of a haggis—that, " great chieftain of the pudding race " which was bewitched, probably to punish niggardliness or lack of hospitality, are recorded thus—

" *The haggis of Benga'*
" *Lap out o' the pot and waured them a';*
" *Willie rade and Jennie ran,*
" *But down the burn the haggis wan.*"

Bengall, the Gaelic-derived name of which bears exactly the signification of the Roman-named Egremont, is a farm in the parish of Dryfesdale.

The parish of Tundergarth bounds that of Dryfesdale on the east, and, when I knew it, "the sound of the church- " going bell " was never heard there. My poetical friend Susanna Hawkins, at her last professional visit to Liverpool, gave me to know that this important want has long been supplied; but formerly there was no bell to Tundergarth

kirk. Its absence was accounted for by a tradition, that it was stolen by a party of English reivers, and appropriated by the worshippers at the parish church of Bowness on Solway; moreover, it was averred, that the bell itself has ever since protested against the theft, by making its chimes syllable themselves into a reiteration of the words "carry me back." Hence the local saying, "*Carry me back says Bowness bell.*"

Hoddam, the parish south of Tundergarth, possesses, amongst other beauties, a fine conical hill, and, on its summit, commanding a view of the whole firth of Solway on one side, and an extensive inland prospect on the other, stands a square tower, which has all the appearance of having been a beacon or watch tower. Tradition assigns to it a different purpose and origin. It is said that a lord of Hoddam, when returning across the firth from a successful raid into Cumberland, laden with spoil and prisoners, found it necessary to lighten his boat; and as men and women were less needed at Hoddam Castle than plenishing, he threw the live lumber overboard, and so reached the shore in safety. Being afterwards seized with remorse, he built this tower for a place of retirement, and a monument of his contrition. Hence it has been called, time out of mind, "The tower of Repentance." A popular verse celebrates it and the loveliness of the adjacent scenery, taking special notice of its second most prominent feature :—

"*Repentance stands upon a hill,*
"*Most beautiful and fair,*
"*Hard by another wooded hill*
"*Far kenned as Woodcockair.*"

There is a curious anecdote told of Sir Richard Steele, in connection with this edifice, and, as it has given rise to a popular saying, and has never as yet been quite correctly put in print, I give it room here. It is said, that this great essayist, travelling in the south of Scotland, came upon a herd-boy reading intently, who, in reply to Sir Richard's

enquiry as to the nature of his studies, said he was learning the way to heaven. On being asked if he had found it, the boy replied, "Yes! we have to gang by yon tower and "then come in by that farm toon." The boy's meaning was made clear to Steele, on his learning that the tower was called Repentance, and the farm, Relief, and the common saying remains, that "*The way to heaven is o'er by Repentance, and "in by Relief.*" Such a play upon words, even on so solemn a subject, is by no means rare in Scotland.

We are upon classic ground here, for the tower of Repentance almost flings its shadow over the birthplace of Thomas Carlyle; and Susanna Hawkins, the poetess, has built herself a bower on the estate of Relief, and lives there in comfort and respect upon the proceeds of her literary labours. The parish of Hoddam also, has the honour of containing the town of Ecclefechan, proverbial throughout Scotland for high breeding and politeness, insomuch, that it is common to hear rude or vulgar people advised to "*gang to Ecclefechan, for half a "Saturday, to learn manners.*" The period assigned as sufficient for the purpose, is suggestive of the means of improvement in operation there.

A proverb formerly current along the Border refers to a custom now happily worn out, that of making funerals occasions of festivity, and often of debauch, which indeed was the rule in all the rural parts of Scotland, and was due, no doubt, to two prominent characteristics of the Scots people. First, their disposition to make all gatherings of neighbours seasons of festivity; and, secondly, the national tendency to hospitality, impelling the friends of the deceased to entertain handsomely those assembled at their home, even for the saddest of all the offices of friendship. The proverb says, that "*A Border burying is better than a Carel "(Carlisle) wedding.*" It serves two popular purposes—lauding their own hospitality, and throwing an imputation of

stinginess upon the burgesses of the nearest *English* town. That burials were not the lugubrious affairs they are now, is shewn in an anecdote recently forwarded to me, with the last quoted proverb, by a valued friend in the North.* A family named Ivison was remarkable for the habit of indulging in loud obstreperous mirth. Once when the inhabitants of a village were waiting out of doors to see a funeral procession pass, an old wife announced its unseen approach thus—"They are coming now, I hear the Ivisons laughing!"

With these funereal fragments I may appropriately conclude this small collection of shreds and patches once observable on the surface of social life in an interesting district—a district in which the contrast between present and comparatively recent times is perhaps more marked than in almost any other. Within my own limited remembrance the difference is striking, not to say saddening, to one who, in his youth, was, without recognizing their true character and significance, thrown into frequent and familiar relations with vestiges of a bygone state of society, traces of a peculiar feudalism now faded and lost, save in so far as they remain in the recollection of those who, as in my own case, have, almost unwittingly, kept them in memory to be reproduced fortuitously on some such occasion as the present.

Note A.—In a modern local poem called "The Battle of Dryfesands,' by William M'Vitie, the chiefs that followed Lord Maxwell's banner and the numbers of their several contingents, are thus recounted:—

"Brave Crichton did an hundred lead,
"As good as e'er did weapon wield;
"Like rushing torrent seemed their speed
"At onset on the battle field.

"Drumlanrig brought an hundred more,
"Inured to broils and battles long;
"Kirkpatrick's followers full fourscore,
"All healthy, active, young and strong.

"Dalswinton numbered eighty nine,
"As many followed brave Cowhill,
"All clad in dazzling armour fine,—
"Their leaders famed for martial skill.

"Full fifty men Carnsalloch led,
"So truly trained to sword and shield,
"His worthy self, a warrior bred,
"Had fought in many a far-famed field.

---

* Wm. Randleson, Esq., of Crofthill, Whitehaven.

"Renowned Dalziel, a veteran old, [fought,
"Who 'gainst the Johnstones long had
"Yet still a warrior brave and bold,
"From banks of Æ an hundred brought.

"The offspring of the Longueville's,
"Brave Charteris up in haste arose,
"With sixty followers at his heels,
"As good as e'er encountered foes.

"The Laird of Lag brought fifty-four,
"Young Maxwell, too, of Breckonside,
"With armed followers full fourscore,
"So proudly marched in martial pride.

"The Abbot of New Abbey came,
"With full an hundred men of might;
"Carlaverock's Vicar brought the same,
"All trained and ready for the fight.

"The town Dumfries two hundred sent,
"All picked and chosen every one;
"With them their provost, Maxwell, went,
"A bold, intrepid, daring man.

"Lord Maxwell's own dependents rose,
"Eight hundred warriors truly bred;
"Kirkconnel doth the reckoning close,
"An hundred valiant youths he led."

Making together the sum of 2102 men, of which number, the rhyming chronicler states, only 510 returned to their homes. The leaders named were all men of note; "Crichton" of Sanquhar was ancestor of the Earls of Dumfries,—Douglas of "Drumlanrig," of the Dukes and Marquesses of Queensberry,—"Kirkpatrick" of Closeburn of the "Knights "of Closeburn" and, by the female line, of the present Empress of the French,—"Dalziel" of Glenae, of the Earls of Carnwath,—Grierson of "Lag," of the famous persecutor, from the traditions respecting whom Sir Walter Scott framed that terrible episodical tale of *diablerie* in "Redgauntlet," and of the Griersons, Baronets. An ancestor of "Charteris" of Amisfield figures in "The fair Maid of Perth." The other Nithsdale leaders were chiefly Maxwells. Lord Johnstone is said to have been aided by the Jardines, Bells, Irvings, Armstrongs, Carrutherses, Romes, Lawsons, Grahams, Elliots, Murrays and, most important of all, the Scotts of Buccleugh.

Note B.—The old ballad of "The lads of Wamphray," recording a reiving exploit of a branch of the name located in that rural parish, proves that the character given "the gentle Johnstones" in this distich is by no means unmerited. It relates that

"'Tween the Girth-head and the Langwood-en'
"Live the Galliard and the Galliard's men;
"But and the lads o' Leverhay
"They drove the Crichton's gear away.

"It is the lads o' Leithenha';
"The greatest rogues amang them a';
"But and the lads o' Stefenbiggin,
"They broke the house in at the riggin'.

"The lads o' Fingland and Elback hill,
"They were never for good but aye for ill;
"'Tween the Staywood bush and the Langside hill
"They stole the brokit cow and the banded bull.

"It is the lads o' the Girth head,
"The de'il's in them for pride and greed;
"For the Galliard and the Galliard's men,
"They ne'er saw a horse but they made it their ain."

The places named in this rude old ditty are all in the parish of Wamphray, which is separated from that of Johnstone by the river Annan.

LOCAL CHIT-CHAT OF THE "FORTY-FIVE."

By Lieut.-Gen. the Hon. Sir E. Cust, D.C.L. &c., President.

(Read 7th November, 1861.)*

The following correspondence relates to a very interesting period in the history of England. After a long interval of peace, both at home and abroad, the country was suddenly alarmed by the victorious march of a wild multitude out of the Scotch Highlands, who, led by a young Prince of the house of Stuart, had not only defeated and dispersed the King's troops and already taken possession of the northern capital, but now threatened an inroad into England. It may well be conceived what a commotion must have been occasioned in the quiet hills and valleys of the border counties by the expectation of a sudden condition of intestine war, and how Lancashire, Cheshire and North Wales would soon catch the infection. There was well known to be, in those counties, a strong party in favour of the old family, and, when no one at such a moment dared trust his neighbour, there could be none so fit to rely upon for advice or information as a friend in the capital—especially when it is remembered that a newspaper was at that period but a hebdomadal luxury, and the market gossip was very uncertain and not likely to be at all assuring at such a moment of peril and alarm to a country community.

The private letters of a barrister to a country gentleman are not likely to add much to our knowledge of the secret causes of events, but they are interesting in a lower degree, as illustrating what the mass of the community thought of the

---

* Vol. II, N.S., p. 173.

events of the period, and especially to the Historic Society, when it is considered that the palatine counties of Chester and Lancaster were, to a very considerable degree, affected by the episode of the "forty-five;" and indeed the more especially because there is now conclusive ground for believing that it had been the intention of the rebels to pass through them into North Wales.

The first letter of this collection is dated October, 1745. The Pretender was at this time at Edinburgh. He had entered that city, with his army, after the battle of Preston-pans, with every token of triumph. The news of this battle, which told the complete overthrow of all the force that Government had been able to send against the insurgents, occasioned a violent revulsion of public feeling in favour of the victor, and spread proportionate consternation among all who had any interest in the Hanoverian cause. The whole of the Scottish state-officers, as well as many inferior persons enjoying public trust, betook themselves to flight in disguise to England or to remote parts of their own country; and in all Scotland there did not remain a single friend of Government who ventured to declare himself, excepting those who kept the fortresses; for the main strength of the British army was absent at this moment in Flanders.

It is the opinion of many that had Charles at the time made a descent upon England, he might have dislodged his Majesty from St. James's and exchanged with him, for a time at least, the titles of King and Pretender. However, the royal cause recovered heart, as may be seen from an extract of a letter from London :—

October, 1745.

I think I may now congratulate you upon the appearances we have of bringing our enemy's schemes to destruction; and I cannot help thinking but that Cope's miscarriage has been the means of rousing great numbers out of that great indifference

which has been too long shown for the Government, and will, for many years to come, make us more united than we have been for many years past.

Until this time the English Government had thought but lightly of this rebellion; but now that matters had become alarming, King George returned in haste from Hanover, and an army was sent to the North, under Marshal Wade, to meet the Highland army; but by the time this reached Newcastle the Pretender was already on his march into England. In the meanwhile, on the 13th of November, after a short siege, Carlisle capitulated and the insurgents seemed to have nothing to do but to go forward to London, in order to accomplish their object. Their route lay by Shap, Kendal and Lancaster to Preston, where the army rested on the 27th. From Preston they marched to Wigan and from Wigan to Manchester. At Manchester a circumstance occurred, which is worth recalling to our memory, as it shows the individual enterprise and courage of the Scottish partisans and the general terror with which the English were already seized. A man named Dickson, a sergeant, enlisted from the prisoners taken at Preston, having got a day's march ahead of the army, entered Manchester, with a boldness which almost surpasses belief, on the morning of the 29th, with his mistress and a drummer, and immediately began to beat up for recruits. The populace at first did not interrupt him, conceiving the whole rebel army to be near the town; but as soon as they knew that it would not arrive till the evening, they surrounded him in a tumultuous manner, with the intention of taking him prisoner, dead or alive. Dickson presented his blunderbuss, which was charged with slugs, threatening to blow out the brains of those who first dared to lay hands on himself or the two who accompanied him; and by turning round continually, facing in all directions and behaving *en vrai lion*, he soon enlarged the circle which

a crowd of people had formed around him. Having continued for some time to manœuvre in this way, those of the inhabitants of Manchester who were attached to the house of Stuart took arms and flew to the assistance of Dickson, in order to rescue him from the fury of the mob—so that he had soon some five or six hundred men to aid him, who dispersed the crowd in a very short time. Dickson now triumphed in his turn and, putting himself at the head of his followers, proudly paraded the town undisturbed the whole day, with his drummer, enlisting all who offered themselves to be enrolled in the Pretender's cause. That same evening, on presenting 180 recruits to the Highland army on their march, it was found that his whole expenses did not exceed three guineas. This adventure afterwards gave rise to many a joke at the expense of the town of Manchester, from the circumstance of its having been taken, with all its 30,000 inhabitants, by a sergeant, a drummer and a girl!

The recruits were immediately embodied with the others who had joined in England—the whole taking the name of "The Manchester Regiment,"—and were commanded by Mr. F. Townley, of a very old Roman Catholic family in Lancashire, one of the few volunteers who had yet joined the Prince. Such accessions, however, were very far inferior to what the insurgents had expected, or their predesessors had experienced in 1715. At that period Lancashire was nearly all devoted to the Stuart cause; but it is evident that the lapse of thirty years had quenched the flame of Jacobitism among the common people, and that even in the minds of the gentry it then burned only with a dim and wavering light.

It was now expected that the Pretender and his army would march into Wales; and all the bridges over the Mersey in that direction had been broken down to retard their motions. It was at Manchester that Charles published the following curious proclamation:—

To the Inhabitants of Manchester.

His R. H. being informed that several bridges had been pulled down in this country, he has given orders to repair them forthwith, particularly that at Crossford, which is to be done this night by his own troops, though his R. H. does not propose to use it for his own army, but believes it will be of service to the country; and if any forces that were with General Wade be coming this road, *they may have the benefit of it.*

Manchester, November 30, 1745.

The following letter is dated November 28th, 1745, and shows the fears that were entertained by those who had friends in Wales. It was written by Mr. Hutton of Hertfordshire, to his brother-in-law, Mr. Yorke of Erddig.

Dear Sir,

I begin to be in concern for you and your family, on account of the rebels; but, by the best intelligence I can get, I hope they will not be able to reach Wales; however, I don't in the least doubt, from your great prudence and good judgement, but that you will take all proper precaution in case they should. If you should think it advisable to come southward, as far as us, you can surely want no invitation. We should all, I daresay, rejoice to see you; and I don't doubt but my mother has mentioned it to you: if not, I am sure it proceeds from not knowing the danger you are in. I have it for good authority that the rebels have dwindled to about 4,000 fighting men, which, compared to Ligonier's army, is but an handful of men. Judge Reynolds assured me to-day he will have 12,000 old disciplined troops, with three battalion of the guards at the head of them, besides the now raised regiments, and he thinks they cannot get by him into Wales. Warrington bridge is broke down, which, Mr. Perkins tells me, will retard the march of the rebels two days. I saw a letter from Penrith, which gives an account that the rebels are drawing their baggage back to Carlisle, and it is supposed from thence they are about to retreat. You have seen the account of the privateer taken by the *Sheerness* man-of-war. We have no

particulars yet of the persons on board; but it is generally thought the younger brother of the Pretender is one of them.

The worst piece of news in town, I think, at present is that the Government cannot raise money for present service at the rate it has done of late years. I am told that the moneyed people insist upon 4½ per cent. Should they prevail in it, it will be fixing the interest the Government must pay for all the money they want to raise this year, and will be a great detriment to the present proprietors of the funds and annihilate part of our fortunes. Another thing, all trade is clogged, a good deal at a stand and no money to be got but a little silver.

I am,

Yours, &c.,

MATTHEW HUTTON.

Another letter of the same date, 28th November, is written by a lawyer in London to Mr. Yorke.

Dear Sir,

I had your last favor, and was rejoiced to find your uneasiness on account of the rebels' progress towards Cheshire was abated, and though they are since advanced much further, yet as the Duke with his army is, I hope, by this time advancing towards them, and preparations are making at Chester for a vigorous opposition to their coming into Wales through Chester, I am willing to believe that should they slip by the Duke and advance towards Chester, that he will come time enough for its relief. Nay, I am inclined still to think that as their expectations of being joined by people in England and being assisted from abroad have not been answered, that they will endeavour to return to their own country the way they came from thence or through Yorkshire; and whichever of these roads they take, I hope Marshal Wade will meet with and give a good account of them. By very good accounts from the north, they do not amount to above 6,000, and many of them very mean, unsoldier-like fellows. They have hitherto met with no resistance; but what can they do, when faced by approved soldiers, animated with the highest contempt of them? The Duke, attended by Col. Yorke, set out on Tuesday

afternoon in his post-chaise, and proposed being at Litchfield yesterday; and though that was the place appointed for the rendezvous, yet I hope, as the rebels have been advancing, some part of our troops (sufficient at least to abate their forced marches) have been advancing further. I am the rather willing to hope these things may be so, as I find, by good Mrs. Mainwaring's letter to her son, that her uneasiness is very great, and which she expressed in so moving a manner, that I was sorry I had seen her letter. By the time you receive this, the rebels' intentions will be very likely shown; and it will give me the greatest pleasure to hear that you are all in good spirits. It was strongly reported that the Pretender's younger son was on board the privateer brought into Deal, but it is not now believed. The young Pretender's declarations enlarge very much on the protests and speeches of our pretended patriots' grievances, and which he says he has come to redress. What excuses can they resort to who have brought so great calamities upon so many thousands of their fellow-subjects, and traduced a Government much too mild for such a race of men? For which of them can truly say whose ox or whose ass has been taken from him. On the contrary, many of them are now hazarding their lives in the defence of that Government they have long with the greatest vehemence been vilifying, under the most false though specious pretences.

R. WOOLFE.

As the rebels were still at Manchester, uncertain which way to turn, this gentleman's congratulations to his friend in Wales were perhaps somewhat premature.

On the 29th of November, finding that all the bridges over the Mersey were broken down to impede their progress, the rebel army directed their march towards a fordable part of the river, on the road to London, marching in two columns, one towards Stockport, the other towards Knutsford. Near Stockport the Prince passed the Mersey, with the water up to his middle. The horse and artillery passed, with the other detachment, at Knutsford, where a sort of bridge was made up by

filling up the channel of the stream with the trunks of poplar trees. On the evening of the 1st of December the two bodies had joined at Macclesfield.

As Charles advanced from Manchester, he found the people of the country very little inclined to favour or assist him, displaying no sympathy or fellow-feeling with the "wild "petticoat men," as they called the kilted Highlanders. On the other hand they showed an equal unconcern to the interests of the reigning family; and looked coolly on the struggle, as they might upon a game, forgetting that they themselves formed the stake of the players.

The poet Gray writes from Cambridge—"Here we had no "more sense of danger than if it were the battle of Cannæ. "I heard three sensible, middle-aged men, when the Scotch "were said to be at Stamford and actually were at Derby, "talking of hiring a chaise to go to Caxton (a place on the "high road), to see the Pretender and Highlanders as they "passed."

From Macclesfield Lord George Murray (who commanded one of the divisions of the rebel army), by a dexterous manœuvre succeeded in completely misleading his enemy, and advanced, with his column of "wild men," to Congleton, where he dislodged and drove before him the Duke of Kingston and a small party of English horse, pursuing them with his vanguard some way on the road to Newcastle.

When intelligence reached London that the Highlanders had got past the royal army and had reached Derby, within four days' march of the capital, a degree of consternation pervaded the public mind, of which it is impossible to convey any idea. An immediate rush was made upon the Bank of England, which, it is said, only escaped bankruptcy by paying in sixpences to gain time. The shops in general were shut, public business was for the most part suspended and the

restoration of the Stuarts expected by all as no improbable or distant occurrence.

The Pretender passed the evening of his arrival at Derby in the highest spirits and, after supper, studiously directed his conversation to his intended progress and expected triumph—whether it would be best for him to enter London on foot or on horseback, in Highland or in English dress. Far different were the thoughts of his followers. Early next morning he was waited upon by Lord George Murray, with all the commanders of battalions and squadrons; and a council being formed, they laid before him their earnest and unanimous opinion for an immediate retreat to Scotland. Their force consisted of barely 5,000 fighting men—a number insufficient to give battle to any of the three armies by which they were surrounded; nay, scarcely adequate even to take possession of London, were there no camp at Finchley to protect it. The English army was not less than 30,000 men although, it is true, all that could be assembled in the Kingdom were there combined.

The council, headed by Lord George Murray, represented to the Prince how much wiser it would be to retreat while it was yet time to support and be supported by their friends in Scotland. "Already," said Lord George, (and he pointed to despatches which had reached the Prince that very morning,) "we learn that Lord John Drummond has landed at Montrose, "with the regiment of Royal Scots and some picquets of the "Irish brigade, so that the whole force under Lord Strathallan, "ready to join us from Perth, is not less than three or four "thousand men;" and he stated many other good reasons. After summoning another council that evening, Charles sullenly and with reluctance gave in his consent to a retreat. The Highland army pursued their retreat by the same track as they had come, and it was concerted with so much secresy and conducted with so much skill, that it was

two days' march ahead of the royal forces ere the Duke of Cumberland could make himself certain of the fact or take measures for a pursuit.

The Pretender's cause was at this period by no means so hopeless as Lord George Murray apprehended. Prince Charles has left evidence in the Stuart papers, that a Mr. Barry had waited upon H.R.H. when at Derby, sent by Sir Watkin Winn and Lord Barrymore, to assure him in the name of their friends, that they were ready to join him, in what manner he pleased, either in the capital or in their respective neighbourhoods. The Jacobite party was also very strong in London, and Alderman Heathcote, one of the city members, was in communication with Sir Watkin, to assure him that they would rise in London immediately on a landing and to beg that arms and ammunition might be sent them. A curious picture is in one of the apartments at Goldsmith's Hall, in the city—an exceedingly good one, by Hudson, the master of Sir Joshua Reynolds, and therefore contemporary of the '45, which records a festive meeting of six Aldermen, in the act of drinking the Pretender's health, and under the chair of the President is an open letter, addressed to Alderman Blackford, and franked "Free Wat. W^ms. Winn." One of the party (Sir Henry Marshall, an ancestor of my own) had been Lord Mayor the previous year.

It was not until the Prince had reached the county of Westmoreland that the royal army came up with the insurgents. On the evening of the 17th their main body, headed by Charles, had entered Penrith, but the rear-guard, under the command of Lord George Murray, had been delayed in their march by the breaking down of some baggage waggons and could proceed no further than Shap. At Clifton Moor an engagement took place and the English were completely repulsed. On the following day, the 19th of December, Charles and his troops arrived at Carlisle.

A letter of this date is interesting, as giving an account of the volunteer excitement of the period.

Lincoln's Inn, 19th Dec., 1745.

Dear Sir,

The fears of the rebels in your part of the world being now removed, I fancy you'll be wishing for some accounts relating to the talked of embarkations from our implacable enemies. As to which I can only tell you that every day produces various reports, as well as to this as other public affairs, and that nothing, I think, can be depended upon till it has actually happened. So that this is chiefly to congratulate you on your being freed from your late apprehensions, and to wish you and yours the usual Christmas compliments.

As my pen is in my hand, I cannot help telling you that about twelve days since I 'listed in a regiment of lawyers, amongst whom were your Chief Justice and Mr. Serjeant Willes. As possibly you may not have heard anything of this matter, you must know that several gentlemen of the law had been for some time learning the military exercise; and on Friday seven-night there was so great a panic here, lest the rebels should be with us in a few days, that on Saturday morning early several of the Inns of Court gentlemen had a meeting in the Middle Temple hall, when they appointed a committee to consider in what manner they might be serviceable and to give notice to the profession to meet there again at noon. Pursuant to notice, I went thither, and we were told that if a regiment could be formed, the Lord Chief Justice Willes would have a commission granted him as Colonel and that their service would be as a guard to the royal family during his Majesty's absence, who, it was there said, was forthwith going to Finchley, where a camp was immediately to be formed. The meeting was very numerous, as likewise in the afternoon, Sunday afternoon and Monday, both fore and afternoon—for you must know that many amongst us had different schemes to propose, as to the nature of our service, what was to be our uniform, how to be officered, &c. Amongst so many, especially of the young barristers

and students, there would be many speakers. Our last meeting was the Tuesday morning, when it was expected our Colonel would have produced his commission, but he read us a letter from Lord Harrington, signifying that, as affairs now stood, his Majesty had no thoughts of taking the field and remitted our service and returned his thanks for our zeal &c. I fancy this was very mortifying to many of the smart gentlemen: as to myself, I was very glad of it. For on the Sunday morning I put myself (with my firelock upon my shoulder) under the direction of a real military sergeant, but found, to my sorrow, that my zeal was far greater than my abilities, and that my musquet was too much for me to manage with any tolerable alacrity; and had the project gone on and I could not have obtained my discharge, I must have been under the necessity of deserting, but not for the same reason that Timothy Pescôt flew from his colours. But to be serious:— when I set my name to the roll, I did it most heartily, but I soon after found that nothing would come of it.

Since I begun my letter, I hear accounts are come to-day that Admiral Townsend having met with a fleet of French merchant ships, bound for Martinico, has burnt or otherwise destroyed ten and took twenty of them, and that an express is arrived from the Duke from Lancaster, dated Tuesday morning, when the rebels were at Shap, thirteen miles from Kendal, where he would be that night. As there will be an extraordinary Gazette to-night, you'll have a very particular account in it in relation to the rebels. Townsend's affair is certainly true and better, as I hear, than I have mentioned. A message from his Majesty was this day sent to both Houses, acquainting them that he had, pursuant to a treaty in June last, taken into pay 6000 Hessians for the service of this nation, against all attempts of foreign powers. The Lords resolved to present an address of thanks, and to assure his Majesty that they will readily contribute to the strengthening his Majesty's forces for the security of this kingdom. But the other House are debating upon it.

Yours &c.,

RICHARD WOOLFE.

To connect these letters a slight sketch of the events that occurred has been derived from the histories of the Rebellion of 1745, which may render the narrative, which refers more particularly to this part of England, more intelligible and interesting to us. After spending one night at Carlisle, Prince Charles and his army on the following day crossed the Esk, the border river, and was again in Scotland. His expedition to England had lasted six weeks. He had penetrated into this country further than any hostile force had done since the Norman Conquest. It had been done in the face of two armies, each capable of utterly annihilating it. Yet such was the success which will sometimes attend the most desperate case if conducted with resolution, that from the time they entered this country until they left it, only forty of the insurgents were lost out of five thousand by sickness, marauding, or the sword of the enemy. A magnanimity was preserved even in retreat, beyond that of ordinary soldiers; and instead of flying in wild disorder, a prey to their pursuers, the desultory bands had turned against and smitten the superior army of their enemy with a vigour that effectually checked it. They had carried the standard of Glenfinnin a hundred and fifty miles into a country full of foes, and now they brought it back unscathed through accumulated dangers of storm and war.

The next letter of Mr. Yorke of Erddig's correspondent is dated—

February 6th, 1746,
Whitehall.

Dear Sir,

It is with the greatest satisfaction, that I congratulate you upon the good news contained in the Gazettes, which I take the liberty of sending you enclosed. Miss Jenny Cameron, who has frequently been mentioned in the newspapers

as a lady of spirit and gallantry and in high favor with the young Pretender, has been taken prisoner by the King's troops.

I am, &c.,

Yours,

H. J. JONES.

In these days we can hardly understand the great public sensation which the capture of an enthusiastic young lady seems to have produced; but perhaps she was the heroine on whom this epigram was composed:—

"Pretty Tory! where's the jest
"Of wearing orange in thy breast?
"When that same breast exulting shews
"The whiteness of the rebel rose."

On the 17th of February, 1746, was fought the battle of Falkirk. The Duke of Cumberland had, after the siege of Carlisle, returned to London leaving his troops under the command of Lieut.-General Hawley, who was ordered to conduct a portion of the army into Scotland, where he was signally defeated by Charles at Falkirk. This battle was Charles's last victory, and was thought to have proved hurtful instead of advantageous to his cause. He had previously raised the siege of Stirling Castle, which he again resumed, thus leaving his enemies full leisure to recover from their recent defeat. When the news of this disaster to the English army, whose loss had been considerable, reached the Court of St. James's, (it was on the day of a Drawing Room,) every countenance appeared clouded with doubts and apprehension, except only the King's, whose heart was by temperament inaccessible to fear, and perhaps Sir John Cope rejoiced a little to have in Hawley a partner in his misfortune. The Duke of Cumberland laid the blame of the affair on Hawley who, he said, maintained no discipline; and added that, "were he there, he would attack "the rebels with the men that Hawley had left." His Royal Highness was at once appointed to the chief command of the army, and set out immediately. Travelling night and day, he

arrived most unexpectedly at Holyrood House on the morning of the 30th of January, 1746, and on the 31st he set forward with his army to give the insurgents battle. The following letter shows that a battle at this time was fully expected.

Extract of letter—

Lincoln's Inn,
6th March, 1746.

I fear the young Pretender has still a considerable number of Rebels in a body with him, and that there are others in smaller parties who will be able when the brave Duke (whom God preserve) gets near them to join in one body, so that I doubt the Rebellion is not so near being extinguished as our sanguine hopes have made us imagine it to be, and I wish the danger being so remote may not be the means of slackening that zeal in many people from what they showed when the rebels were nearer our own doors; otherwise it seems very unaccountable there should be any amongst us, who should think at this time of giving interruption in the means of raising the supplies. But such there are, for after acceptance and agreement with certain persons for raising three millions, we have now schemes from Sir J. Barnard; and, I believe, a strong party making against the Bill when it comes into the House. Yesterday was expected to have been the day for discussion but it stands over for next Wednesday.

Yours &c.,
RICHARD WOOLFE.

On approaching Falkirk, His Royal Highness was informed that the rebels had already commenced their retreat. The leading men of the insurgents had insisted on retiring into the Highlands, and a consultation had accordingly been held by them at Stirling, the result of which was a memorial, signed by the greater number of Charles's officers and sent to the Prince by Lord George Murray, which, after lamenting the number of Highlanders who had gone home and the unequal chances of another battle, counselled a retreat which, while it disconcerted the enemy, would enable them to recruit their

diminished bands. With increased reluctance Charles again assented to go back, and the insurgents accordingly began their retreat on the 1st of February, first spiking their heavy cannon and blowing up their powder magazine at St. Ninian's. The direction of the retreat was to Crieff and so on to Inverness. They were pursued, but not overtaken by the Duke of Cumberland, and it was not until the 16th of April that the two armies met, when the battle of Culloden was fought. It is said to have lasted little more than forty minutes, most of which brief space of time was spent in distant firing, and very little in the active struggle. The royal army was completely victorious. The hopes of the Pretender were for ever ended. His army was scattered; many of his bravest officers were taken prisoners, and his adherents, everywhere seized by the English Government, were committed for trial.

From this time the princely chief of this ill-fated enterprise wandered for five months, sometimes alone, sometimes with a single Highlander as his guide and companion—a price set on his head—hunted from mountain to island, and from island to mountain—pinched with famine, tossed by storms and unsheltered from the rains—his strength wasted, but his spirit still unbroken. Cheered by the comforting devotion of the celebrated Flora Macdonald, he at length reached the Isle of Skye, where two French vessels, despatched on purpose to take him off, arrived and conveyed him to France in safety. Flora was the daughter of Macdonald of the Clan Ranald.

The following letter is written after the news of the victory of Culloden had reached London—

Lincoln's Inn, 1st May, 1746.

Dear Sir,

I herewith send you the address of both Houses. You will perceive by them that spirit is shown, I hope wholly to put it out of the power of the Scotch ever to disturb our peace

again. The Commons are proceeding on the examination of witnesses to prove a great number of the most considerable being in the Rebellion, in order to insert them in a bill of attainder, in case they do not surrender to a certain time; and it is now thought the Parliament will sit the greatest part of the summer. Our Gazettes are very imperfect in the accounts of the late glorious victory, and I believe purposely lessen the number of slain, for I believe we gave very little quarter during the action or pursuit, to stop the clamour of a certain lot of persons, who at the same time they would be thought to rejoice for our having obtained a victory, wish it had been at a less expense of the blood of so many fellow-subjects. I must own, that I am so blood thirsty, that I wish every man of them had died by the sword. I fancy your this night's evening paper will contain some of the accounts published in Scotland, as well as some private letters, which you will find to be a much better relation than our public accounts have been. I am told Colonel Yorke's is by far the best, and was extremely approved by His Majesty. My last brought you the numbers, ayes and noes, in the committee of supply. It was debated again on the report, and begun by your great neighbour. Their speeches were mostly levelled at their late consort Mr. Pitt, he (Pitt) spoke exceedingly well, and treated them with the utmost contempt, called them a stubborn, blind faction, and compared them to flies who buzzed and tickled, but which with the waft of a hand were dispersed. The numbers for agreeing to the resolutions of the committee, were 199 against 83. Horace Campbell, on the motion for the address, proposed an amendment, by inserting the word British, between the words "your Majesty's" and the word "arms." This was lest it should be thought the Hessians have had any share in our successes, and quoted, but I do not understand rightly for what, as a precedent, the address of taking Portobello, with six ships only. This occasioned old Horace to be witty, and he agreed to this proposal, provided it should be mentioned that the Pretender landed in Scotland with six men only, and soon after was joined there by twice as many thousands of that part of the Kingdom; was now run away with two persons only, *not Scotch*,

not thinking himself safe in his flight if attended by them—so Campbell dropt his amendment.

Yours &c.,
RICHARD WOOLFE.

Long before Charles's escape, however, a multitude of his followers, less fortunate than he, had met a cruel and bloody death upon the scaffolds of England. The officers of the English regiment taken at Carlisle were the first victims of the sanguinary calenture. Eighteen of these unfortunate gentlemen with Colonel Townley at their head were tried, and condemned to death, and on the 30th of July were executed on Kennington Common. The following extracts of letters dated 23rd June and 19th July, allude to this event.

23rd June, 1746.

The trials of the Rebel Lords are now fixed for the 28th of July by indictment, and the trials to be in Westminster Hall, and all Peers summoned. It is said six out of them will plead guilty. But, Lord Cromartie pretends not to have been in arms. Lord Lovat is certainly taken. I have seen a copy of a letter from him to the Duke, desiring leave to kiss his hand, and imploring his interest with his Majesty for mercy. Indictments have been found by the grand jury against all the Carlisle rebels that were brought up here, (except three who have escaped), and their trials will begin the 17th of July. The embarcation intended for Cape Breton is now laid aside as being too late in the year, and probably, the troops, or part of them will go to Flanders. The captain of the yacht that went over with the Prince of Hesse is returned, and says the allied army is 5,000 effective men, very fine troops, and will go in quest of the French without waiting for the reinforcements that are expected, unless they speedily join, and which would make them about 8,000. Admiral Martin has missed the French squadron, which it is said sailed the 4th of this month, the best opinions seem to be that they have no troops on board, and are going to convey an outward bound fleet, and escort another homeward bound.

19th July, 1746.

Fifteen of what are called the officers in the Manchester regiment, will have sentence passed on them on Tuesday, and such as His Majesty doth not think fit objects of his mercy, will (it is thought) be brought up the week following. On Friday, the trials of the Scotch officers that are here will begin.

Another letter is dated 26th July, 1746.

Dear Sir,

My Lord Chancellor and the two Secretaries of State were at the Tower with Murray, from Ten o'clock on Thursday night till Four yesterday morning, and it is thought he must have made some very important discoveries. We had great rejoicings last night on the Duke's safe return; and are in hourly expectation of hearing there has been a battle in Flanders. It is now said our young warrior will by Prince Charles's being there, be disappointed in his wishes of making a second campaign. I hear Colonel Yorke is very well. The Rebel Lords have not petitioned for council, so it is thought on Monday they will plead guilty, and receive sentence on Tuesday. This morning the judges met again at St. Martin's Hill, the rebels whose trials were to have come on, are ordered by Monday night, to leave with the Solicitor for the Crown, such affidavits as they shall have prepared in regard to their witnesses, and on Wednesday at four in the afternoon, the Court will meet again to consider of them, and the morning following, proceed on the trials of such as shall not have given satisfaction for not being ready. Those under sentence of death petitioned for a respite of execution for a month, but were told the judges had signed a rule for their execution on Wednesday next, so that they must apply to his Majesty. The reason alleged was, that some favorable circumstances for them might appear on the ensuing trials, for his Majesty's clemency. It is generally thought six of them will not suffer death.

Yours &c.,

RICHARD WOOLFE.

The two following letters conclude the series, and give curious details of the trials of two of the Rebel Lords—Cromartie and Lovat.

Lincolns Inn,
18th November, 1746.

Dear Sir,

You'll see by the papers that all the rebels who have been indicted at St. Martin's Hill have been tried. It has appeared in many of the late trials that Lord Cromartie used very great violence in forcing several persons to join him, so that I should think such as appear to have been in that situation and yet have been found guilty, have as good a pretence to mercy as he has met with. I think it now appears very clear that the rebels designed for Wales, and that their going to Derby was a force upon them. I understood your Chief Justice that he intended to send you, by the last post, copies of two letters wrote by Buchanan, who was tried and condemned in the North and executed there: in one of which he writes, that before that time the rebel army must be in Wales. The original letters were produced at his trial, and it is said were furnished by Secretary Murray. This Buchanan was the most considerable of the rebels, having an estate of upwards of £800 a year. He was not in England, and did not himself join the rebels till their return into Scotland, and then was with them in arms in diverse places. His defence on his trial was, that he received a wound in his thigh from the rebels by a shot, which shewed that he was not of their party; but the fact as to this was, and (I believe) was proved, that he had induced a gentleman to raise his clan for the Pretender, and the gentleman finding he had greatly magnified matters in favor of the rebels, went to Buchanan's (otherwise Prior's house), and showed much discontent. It is said, but not proved, he lay there, and next morning was found dead in bed, being shot through the head. His men afterwards waylaid Buchanan and shot him in the thigh. Upon producing the above letters, (which were proved to be his handwriting by his own witnesses,) he made no further defence, but observed that one witness, who had sworn he saw him

in arms at Glasgow, was mistaken, he never having been there,* but said he believed the witness (who had been his servant) thought so, as he might take a gentleman for him, who was very much like him and was at Glasgow. He was proved to be in arms in about eight other places by many witnesses, and same as above, made no objection to the evidence given against him, owned the justice of his sentence, and begged the judges to recommend him to his Majesty for mercy. I have been thus particular, because it has been with great industry given out here, as if this man's sentence was unjust, and was because of having so good an estate forfeited, and as I doubt not but this wicked scandal may have been propogated in your parts. It is said Lord George Murray, though he had a considerable command in the rebel army, was the whole time, or however some time before the glorious battle of Culloden, a spy, and has been for some time in this town and made great discoveries. It is also said we may soon expect to hear of many persons having greyhounds seize them.

Yours &c.,

RICHARD WOOLFE.

Extract from a letter dated 9th April, 1747.

A gentleman of this Inn was at the Tower this morning, who heard old Lovat as he passed a young woman in one of the rooms, ask the officer, if he would not permit him to give her a kiss. The officer gave him a very proper rebuke, so that he contented himself with saying he hoped he would not prevent him from, what he accordingly did, say to her, he wished her well. This gentleman says, that when the old man arrived upon the stage, he sat him

* A curious story is told of Squire Massey of Puddington Hall in Wirral, who had been out in 1715 with the Pretender, but when he quitted him he suspected he should be watched in getting home. He adopted, in consequence, a singular expedient. He quitted the ranks before he reached the boundary of Cheshire and took bye-roads towards the Mersey, which he swam across in its broadest part. But before reaching Puddington Hall he fell upon an unfortunate countryman, whom he beat within an inch of his life. The man, naturally indignant, brought him before the magistrate, who fined him heavily for the assault. When, therefore, the informers came forward to swear to Massey having been with the rebel army on a certain day, he appealed to the magistrate's conviction, but it was not admitted as a full and sufficient *alibi*, for he was subsequently taken and conveyed to Chester Castle, in which captivity he died within a few weeks afterwards.

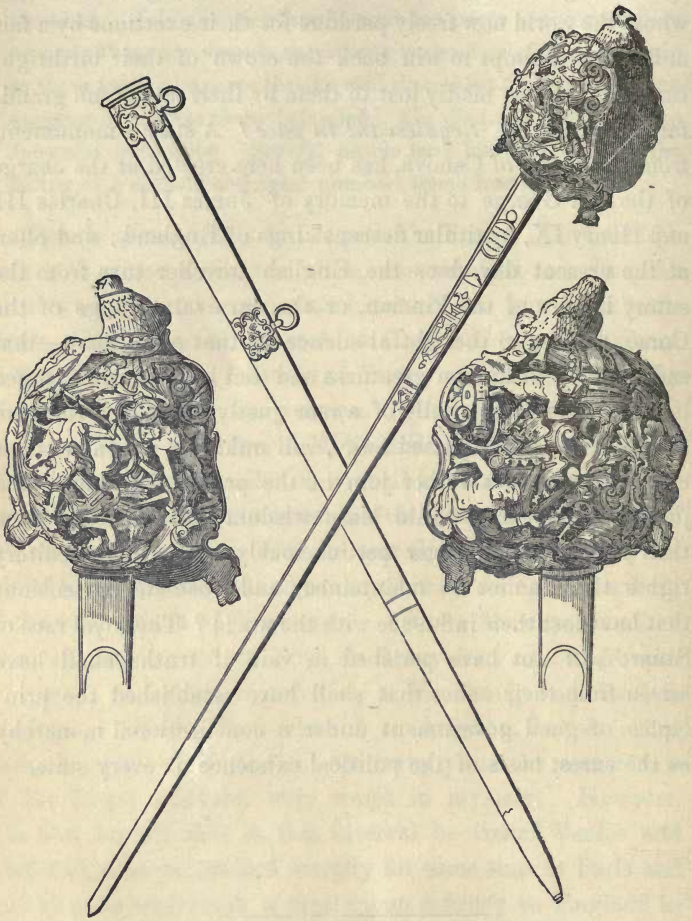
down in a chair about twelve minutes before he laid his head to the block. I do not hear that he read any paper to the spectators or made them any speech, nor of any particulars of what he said to those about him, save that he said that about 500 years ago an ancestor of his was there beheaded. He died a Catholic of the Jansenist persuasion. Several people have lost their lives by the falling of a scaffold and great numbers much hurt.

After the peace of Aix-la-Chapelle the French Court, though willing to please their new allies, was required to relinquish Charles's cause and to stipulate his exclusion from their territories. They proposed to establish Charles Edward at Friburg in Switzerland, with the title of Prince of Wales, a company of guards and a sufficient pension. Charles, however, refused to leave Paris, and Louis XIV, finding threats, entreaties, arguments all vain, called a council of state, where it was deemed the kindest act to arrest him and carry the Prince out of the kingdom by force. He was seized, bound with thirty-six ells of black silk ribbon and conveyed, with a single attendant, to the state-prison of Vincennes. After a few days' confinement he was carried to Pont de Beauvoisin, on the frontier of Savoy, and there restored to a wandering and desolate freedom. Charles first repaired to Avignon, but in a few weeks he again set forth, and for many years the movements of the Royal wanderer were wrapt in mystery. However, it is now known that in this interval he visited Venice and Germany, that he resided secretly for some time at Paris and that he even undertook a mysterious journey to England in 1750, and perhaps another in 1762 or 1763. It was not till the year 1766 that he settled at Florence and married the Princess of Stolberg. There he resided until his death, which took place in January, 1788. His funeral rites were performed by his brother, the Cardinal, but his coffin was afterwards removed to St. Peter's at Rome, where it is deposited next to those of his father and brother. Beneath that unrivalled dome lie

mouldering the remains of these brave and gallant hearts, whom the world now freely pardons for their exertions by a fair and brave attempt to win back the crown of their birthright that had been so madly lost to them by their father and grandfather, James II. *Requiescant in pace!* A stately monument, from the chisel of Canova, has been here erected at the charge of the last George to the memory of James III, Charles III and Henry IX, by titular descent kings of England; and often at the present day does the English traveller turn from the sunny height of the Pincian, or the carnival throngs of the Corso, to gaze in thoughtful silence on that royal tomb—that sad mockery of human greatness and that last record of ruined hopes. The marble tells of a race justly expelled; yet who, after a century has passed away, will unkindly remember their errors, or will not rather join in the prayer that kings and judges of the earth would learn wisdom and prudence from their fate, and no longer pertinaciously adhere to hereditary rights that cannot be maintained, and obsolete pretensions that have lost their influence with the world? The royal race of Stuart will not have perished in vain if truths shall have arisen from their ashes that shall have established the principles of good government under a constitutional monarchy as the surest basis of the political existence of every state.

MEMORANDUM.

The letters are original and unpublished. The historical narrative which connects this correspondence is taken from Chambers's "History of Scotland," and Earl Stanhope's "History of England."



LL. JEWITT DEL. & SC.

[The Claymore of Prince Charles Edward, presented by His Royal Highness The Prince Regent to Macdonald of Clanronald: the Photogram from which this Wood-cut is taken has been the gift of that chieftain to Lieut.-General Sir Edward Cust.]

NOTES ON INSECTS INJURIOUS TO FRUIT AND FOREST TREES.

By Mr. C. S. Gregson,

LATE PRESIDENT OF THE NORTHERN ENTOMOLOGICAL SOCIETY.

(READ 12TH MARCH, 1863.)

PREMISING that there are very great numbers of species of insects which feed upon fruit and forest trees without doing any perceptible damage, I purpose leaving them as harmless and treating only of such as are particularly injurious to the growth of our orchard and forest trees, not having seen anything likely to direct the gardener or forester to the proper and only cure for what is in some districts a source of very great loss. I have thought it best not only to give the life history of each particular species treated of, but also to state my opinion upon the best means of stopping or preventing the evil. Of all the misfortunes which befall an orchard or plantation nothing is so likely to eventually injure it as allowing branches broken by storms or otherwise to remain as they fall; in all cases they should be taken away and the injured parts of the tree cut smooth, else we run the risk of many sorts of insects depositing their eggs in the injured parts, which, once done, the tree is doomed to death. Timber-feeding coleoptera, lepidoptera, diptera &c., are all in search of such places to hide their eggs, free from the prying eyes of the tits and creepers, and where the young larva can commence eating its proper food the moment it requires it. Once the larva begins to feed, its excrement becomes food for other insects, and the tree is regularly beset with natural enemies, damp gets in, fungi grow, and though the tree to-day may be worth

one, ten or twenty pounds, in a few years it cumbers the ground, its very bark has become useless, and the forest we admire at a distance has not a tree in it worth cutting for its timber. See Sherwood forest of to-day.

If I succeed in shewing how our trees can be kept in health, free from their natural enemies, I shall have accomplished my object; and though as an entomologist I may be blamed for shewing the forester and gardener how to exterminate the members of the family I especially study, still, as the benefit of the many must first be studied, I am willing to take the entomologist's blame, especially as I am likely, if my advice is followed, to get the good wishes of my ornithological friends.

On the 15th of March, 1855, eight years ago, I read a little paper before this Society on some of the causes of the abundance or scarcity of insects, in which I attempted to shew the value of birds on an estate. Since then this paper, published in vol. vii, page 237, of your Transactions, has been published many times, re-hashed it is true, but still shewing that it has done its work both at home and abroad. A short time ago it, or one singularly like it, was issued in France. Should my present good word for our birds work its way as well and as far as that has done, your Society will have done its work well in disseminating a better and a wiser treatment of the feathered friends which nature's God, ever bounteous, ever just, sent us to assist in counteracting superabundance.

I have recently been pursuing my researches in the birch-woods around Llangollen, by the kind permission of T. H. Cox, Esq., Sir Watkin W. Wynn's land steward. Here I find the birch trees attacked by a lepidopterous larva which penetrates the bark (pl. v. fig. A) eating between the wood and the bark and so injuring the growth of the tree. In these woods I also find several species of coleoptera (tree borers)

which, having once got into a tree, leave it only when it has become one rotten mass. Some of these beetles are common to both oak and birch, and it is not likely the eye of a forester will detect them unless he is specially directed to them. Perhaps the easiest way to keep them in check is to encourage the woodpeckers, jays and magpies, which love to frequent these woods. No greater mistake can be made by a gamekeeper than to shoot these birds, in a wood where trees are intended to be a source of profit to the estate.

I know what a gamekeeper will say, if told he must not kill magpies &c. I have heard many say "they eat my eggs." Well, for the sake of argument, suppose they do eat eggs, they can only eat them during one month of the twelve, while all the remaining eleven months they are eating food which is either eating his master's food or his property; and, as these birds breed at the same time as the game and then require insect or animal food (worms &c.) for their young, the chances are in favour of the game eggs being let alone, that is, supposing they do eat eggs, about which I am not quite sure. Few birds will allow other birds to approach their eggs or young, and pheasants and partridges, being true *galinulæ*, know how to strike a foe with their heel that is only armed with a bill; they can also strike with the wing as effectually as do the *columbidæ*, and I should not doubt the result of a battle between a magpie and a partridge.

As a proof how birds like beetles, I some time since took out of my roof a nest of young starlings for my children and placed them in a cage so situated that the parent birds could feed them. I cleaned out the cage every night, and regularly every morning by six o'clock we looked at our nurslings, when we found from eleven to eighteen *carabi violacii* and *carabi catenulati* in the cage, divested of their legs by the old birds to prevent their escape. These were over and above what the young required for breakfast, but these and

what the old birds could find for them during the day were required to satisfy them until dusk. If, then, one nest of young require so much food, we might reasonably hope for the very best results to our fruit and forest trees if their natural enemies are regularly kept under by the agents nature's God sent to keep an equilibrium.

One word more. Formerly our land was full of the kite and the buzzard, the latter an especial snake feeder, and then vipers and snakes were seldom seen by husbandmen. Now, in some districts of North Lancashire and Westmoreland, the viper is in such plenty that I have killed very many in one day, and the turf cutters are in constant dread of them, whilst ordinary husbandmen will not cross a moss for fear of them. True, much unnecessary fear exists of their power to injure; but that it does exist was forcibly exhibited at the King's Arms, Hawkshead, to two of us who had been entomologizing on the moors. A stout man who had just succeeded in subduing a refractory bull, ran right out of the house because a friend of mine shewed him a viper in a box on the table. These snakes now thin our ground and low-breeding birds so effectually that the tree creepers, the wrens, pipits and tits are scarce where they ought to be in profusion, and the result is that the larvæ of such species of lepidoptera as *Hibernia defoliaria, abraxes, ulmata &c.*, defoliate the elms; *Tortrix viridana* the oak; *Cheimatobia boreata* the birches; *Abraxes, Grossulariata* and *Halia Wavaria* the currant trees &c.; *Penthina cynosbana* the cherries; and *Hyponomeuta padi* spins its nets over thousands of larvæ on every branch of the garden cherry as well as on the wild cherry tree which is grown so largely in some places for the manufacture of lasts, causing much mischief to this, one of the finest and handsomest trees grown in England; whilst *Hyponomeuta padella* damages the plums and *H. malivorellus* helps the last species to defoliate the apples, *H. evonymellus* is confined to the spindle tree

and effectually prevents its growth, and three years ago I discovered a new species in this genus which injured the buckthorn hedges in North Lancashire and Westmoreland; but, as I observed before, I do not intend to go into all the species which do injury, but, confining myself to those which really cause a perceptible loss upon an estate, proceed to point them out as follows:—

Oak.—Genus Quercus.

Cossus ligniperda, amongst the lepidoptera, is the greatest enemy this forest king has. This moth lays its eggs upon an injured part of the tree in June and July. The young are soon hatched, and commence eating under the bark and thence into the solid timber—feeding at least three seasons, sometimes four, before they leave the tree to enter the earth to assume the pupa state, which they generally do about August, remaining in pupa until the next June or July.

Suppose a tree is discovered to be attacked by this insect, one remedy only remains, which is to cut it down and sell or use it, for if left standing it serves as a breeding ground for its kind, and after the first brood reach maturity they instinctively deposit eggs upon the same tree, so that whenever a tree is found infested with this moth, larvæ are always found within it, in each yearly stage of development. The larvæ grow about one inch per year for three years and, when full fed, are three-eighths of an inch thick, so that the burrows they cut into a full grown oak are almost half-an-inch in diameter; these run in all directions, and soon render the timber valueless, eventually killing the tree. Therefore I say, cut it down.

Pygeæra Bucephala. This moth feeds upon the leaves of oak, birch, sallow, sycamore and chesnut, in the larva state. The perfect insect deposits its eggs upon the branches in July, and the young larvæ are gregarious, feeding together in

hundreds, stripping branch after branch of every leaf during August and September, until part of the tree seems to be dead. The effect is that part of the tree, having no leaves upon it, fails to ripen its wood and the tree is disfigured in shape. Though not otherwise particularly injured by this insect, to destroy it let foresters go round their woods (outside trees are most likely to be attacked, and hedge row trees in August and September.) Wherever a branch, however small, is seen stripped of leaves, let the trees be beat with a pole; the shock will knock off the larvæ, and the fall will injure or kill them. Where birds are scarce this larva abounds.

Orthosia Miniosa. This larva does a little injury to oak plantations until they are 30 or 40 years old; after that no perceptible injury can be observed. The egg is deposited on the young shoots of oak in April and May; the larva is gregarious, living under a web. The perfect insect appears at the end of summer and hybernates through the winter; in spring, it deposits its eggs and dies.

Tortrix Viridana. This small and beautiful light green moth does more mischief in one season to oak trees than all the other lepidoptera put together. Its eggs are laid in July, on the young shoots of oaks, its larvæ are hatched in May following and feed through June between united leaves of (almost exclusively) oak. In 1851 and 1852 I visited Wharncliffe woods (I believe the largest woods in England.) The oaks were perfectly defoliated and the most wonderful sight I ever witnessed could be seen everywhere around me. Countless indeed were the larvæ of this species, as they hung by their tiny silken threads in hundreds from every branch, and doubtless most of them would perish for want of food, for even these large woods could not supply this host. To strike a tree in July on which this species has fed freely, is to give the nearest representation of a snow storm I know; they fly out in thousands, and generally gently down to the ground.

There is but one remedy for these, and that is to encourage the breeding of small birds, especially insectivora and granivorous birds; the latter being supplied with two stomachs, if I may so express it, can and do live as freely on insects as upon grain, and always feed their young upon insects. Stop all sparrow killing, and if need be put up sparrow boxes all round the cottages nearest to the plantations, for the house sparrow (*Passer domesticus*) will not breed where man is not, and the tree sparrow (*P. montana*) loves to build in orchards, as do other finches.

We have not any coleoptera in this district which do very much damage to any but decaying oak trees, and as these should always be removed, I need not occupy time and space by a mere enumeration of names. I will just say that our finest coleoptera eat this tree. Many of the long horned brethren deposit their eggs on injured parts of the tree, and thus we Entomologists know where and what to expect when we see neglected oak woods where birds are scarce.

Oak Cynips. Touching the cynips of the oak, I need not say more than that in my opinion small birds offer the only chance we have to combat this evil on our oak leaves.

Tipulu. These singular flies are to oak woods what Fungi are; they live inside the wood of decaying or dead trees, and though they injure decaying trees, perhaps this is counterbalanced by the rapidity with which they assist the decomposition of dead trees and branches on the ground, thus forming new and rich soil for the healthy trees to flourish in.

Fungi should never be allowed to grow in well kept woods. Once let a fungus get into a wood, and rest assured every sickly tree will be attacked, and if attacked death follows most assuredly. This is particularly the case in birch woods, where the *Polypores* are generally found growing upon the sides of the trees, sometimes 25 feet high. Let all such

attacked trees be cut at once, otherwise they will become useless.

Ash.—Fraxina Excelsior.

This wood, so extensively grown for the use of the wheelwright and coach-maker, in some counties attains a very large size, and is depended upon, as a source of income, by landowners in the north of England, where it is grown very profitably for hoop-wood on land unfit for cultivation, and is cut every fifteen years. Such being the case, let us examine and see why in some seasons it appears as though a blight had passed over it. In May and June we find the whole plantation stripped of every leaf—the terminal shoots covered with a dirty spider-web-like net, in which is a small, light green larva, having darker stripes along its sides, and at once we see the cause. This common little lepidopterous larva has destroyed one year's growth and injured the trees to such an extent that they will never recover the straightness they once had, and in that consists their value. But suppose they have escaped this evil; and in July we find every leaf mined by a small larva forming blotches all over it—the leaf curling up and having quite a dead appearance. Then we have escaped one pest to be injured by another; for here is inevitably the larva of another lepidopterous insect, *Prays Curtisella*, whose ravages I have repeatedly seen extend all through ash plantations. The remedy here is unquestionably the encouragement of small birds. Again, the goat moth, *Cossus ligniperda*, and the coleopterous *Sinodendron cylinaricum* bore into and destroy large ash timber; but the remedy here is the woodman's eye and axe, aided by fire—for if the trees are felled and left in the woods, these internal feeders go on feasting upon the food with which they fall, or change to the next tree. Another wonderfully destructive little beetle

is *biphyllus fraxini* (?), *lunatus F.* Thousands of these insects feed under the bark of the ash, forming little galleries, which are so arranged that every inch or so there is a cross gallery (pl. v. fig. G), by which the insect in the cocoon can, when perfect, work its way to an orifice in this cross gallery and escape. This species eventually loosens the bark from the tree to such an extent that death follows. It is an insidious enemy and, without birds to eat the beetles as they appear, it cannot be kept in check. *Dorces paralleli-pedus,* living as it does in the interior of ashes, can only be got at by woodpeckers, and it forms a dainty meal for them, which they spare no labour to secure. Last May I observed above a bushel of refuse chips at the foot of an old ash in Wales, thrown out by *Picus viridis* whilst in search of this larva in the rotten portions of the tree.

Birch, (*Belula alba.*)

A northern tree, flourishing well on hill sides. It produces a large and valuable tree when left to grow, but when young it is much used in Lancashire for making bobbins, and the straight fifteen-year shoots in plantations are also used for hoop-wood. Many insects feed upon its leaves; but I do not know of one insect which eats its living timber, though many eat it when it is dead; and I have recently discovered the habits of one species, *Trochellium scolæforme,* which eat the bark. For this discovery we are indebted to Mr. Cox, the obliging land steward of Sir Watkin Williams Wynne, who not only gave me liberty to visit the woods near Llangollen to work out its life history, but allowed me to remove the trees, in which this insect was discovered feeding, to my residence where, with hammer and chisel, I have followed its larva through its various sinuous windings under the bark, and so got correct figures of it in its various stages (Figs. B, C, D, E, F). The

eggs, as yet quite unknown, must remain for description at some future time. They are evidently deposited on the bark as I have seen the minute holes the larvæ eat when they make an entrance into the bark, sometimes near the collar of the tree, at other times at a height of several feet. The young larva enters generally in a cleft of the bark where it is softer than elsewhere and eats a sinuous burrow (pl. v. fig. E) into the inner bark, widening it as it grows, still eating nearer to the wood, and so working the bark loose, and drinking the sap of the tree; it lives in a secure dwelling upon the very life of the tree, and remaining as it does for at least two years in the larval state, it has plenty of time to continue the injury, and it only depends upon the quantity of larvæ in a tree whether its days shall be many or few. It is a flattish larva, flesh coloured, with a darker dorsal ganglia seen through its somewhat transparent body; the head is brown, pointed, hornlike; corslet, lighter coloured; and the mandibles rasp off the hard dry bark of the birch, sometimes above three inches thick, when it is eating its way towards the outside of the bark to make up in round pieces like a little logwood mill. When full fed it is nearly one inch long. Having eaten its way to the outside, leaving only a thin skin of bark between it and the outer world, it spins a thick, tough silken cocoon to which the "chips" it has made adheres, and changes to a beautiful brownish chrysalis, darker towards the head, and having the antennæ sheath carried below the wings as in the genus *Dianthœcia*; the perfect insect appears in twenty or thirty days (June and July) and is one of our finest and handsomest Trochilliums.

Chematobia borearia feeds on the leaves of birch and, in some seasons, such numbers of this larva appear that they defoliate the tree; the sap which should then nourish the leaves returns and meets the rising sap and both together force the bark outwards till it bursts, and we then get the

rough-barked birch instead of the beautiful silver bark so ornamental and so wonderfully spectral when seen by moonlight. It is fed upon by several other lepidoptera all of which are readily cleared by birds, and in the broken branches or dead trunks live hosts of coleopterous and dipterous larvæ, which soon cause the tree to crumble away, and by their assistance it quickly makes new soil for other species of trees to grow in : it is a fact patent to all who pay any attention to the growth of trees, that the same species will not grow profitably twice upon the same ground.

The small but magnificent *Argyresthia gœdartelia* feeds in the bark of this tree, but does not go deep enough to do much injury, though its numbers upon a large tree are fabulous.

Elm.—Genus Ulmus.

In this district we have two species of elm ; the wych or red elm does well in our woods, whilst the English or white elm grows well only as a hedge row tree. Its natural enemy, *Scolytes destructor*, once in a plantation of white elms, continues with them for life. To Capt. Cox we are all indebted for a knowledge of the life history of this very properly named insect. He tells us that by carefully going over trees infested by this beetle and cutting out the infected parts, the trees in Regent's park have been preserved from destruction and restored to a healthy state. From my own limited observations on this species I find the eggs are deposited by the parent near, in fact upon, the part she was bred upon, so that they are sure of a ready entrance under the bark, whilst those deposited on a healthy part generally die or get devoured by small birds ; once under the bark they are safe and run their galleries upwards or downwards until the tree is dead, for, living between the trunk and bark, no sap can rise to nourish the tree.

In some seasons wych elm in woods suffers defoliation from the attacks of *Abraxes ulmata* and *Hybernia defoliaria*. The first lays its eggs in July, and the larva, after eating most ravenously for six or eight weeks, goes into the earth, and appears at the end of the following June a beautiful but sluggish moth. The larvæ sometimes make up so close together in the earth that I have known above thirty pupæ to be taken out of a space not larger than my hand. *H. defoliaria*, as its name implies, is very injurious; it has done its injury before *ulmata* commences. This moth appears and lays its eggs on the terminal shoots of trees in November, and the young larvœ are just hatched in time to commence eating the buds as they open into leaf; should the spring be late, all the worse for the trees, as this larva makes no scruple to eat direct into the young bud. This is especially the case when the eggs are laid on oak or birch, on both of which trees it feeds quite as well as it does upon elm.

This larva is an especial favorite of blackbirds and thrushes, and I pity the whole genus Hybernia if there be starlings building near, for they delight in carrying these long larvæ to their young. The coleopterous family *Anobium* loves the elm, though I have never seen them alive in the living timber; but when once they get into a dead branch they go on until it is no unusual sight to see one side of an elm dead, evidently owing to their attacks, whilst the other is apparently healthy.

Lime.

This tree, generally grown as an avenue or hedge-row tree in the north, is extensively grown in some counties for its timber; everywhere it attains great size, and its light-coloured foliage adds much to the beauty of our woodland scenery; it is rarely injured by wood-borers, but has an enemy (small it is true) in *Chrysoclista Linnœella*, which bores into its bark

and lives therein. In July the insect appears in the perfect state and may then be found in *copula* on the trunks of the trees it has fed upon. Laying its eggs upon the same tree, it perpetuates a colony, which eventually destroy the bark in blotches; the wood then decays, and *Anobium paniceum* and *A. nitidum* get a footing and the tree is doomed as a timber tree, though it may live long as an embellishment to park or lawn; if a sickly tree can be so considered in well-kept grounds.

In some seasons this tree suffers entire defoliation from the attacks of the larvæ of *Cidaria fluctuaria*, which infest the tree from bottom to top, first eating holes in its leaves, then spinning a slight web over them, the ribs of the leaves alone remaining to prove their growth. A few other moths feed upon it, particularly *Xanthia citrago* and the whole of the genus Hybernia; but as these rarely do much perceptible injury in consequence of the fondness birds have for them, we may pass them by.

Sycamore

Has few insectivorous enemies. *B. perla* and its congener love to hide under its shade; *Melalontha vulgaris* seeks it for shade and for food whilst in its perfect state only, as it lives in the earth whilst a larva; it has its own *aphis*, which small birds are particularly fond of, especially in wet weather, as the *aphides* are on the underside of its broad leaves and easy to find. I am not acquainted with any insect which perceptibly injures its growth. Its timber is used largely in the manufacture of tools and by brush makers. This tree is only attacked by coleopterous wood-borers where branches have been broken off and the stump left to die. It attains the greatest height of any tree I know, but rarely squares three feet, growing best on the banks of streams. Under the bark which flakes

off the larvæ of *Stigmonota regiana* are found full fed in May, and in March and April the larvæ of *Nola cristulalis* may be found in the same places; neither of them do any harm, but both supply our little birds with food when the ground is covered with snow. At this time the flakes of bark turn outwards on the loose side and our birds revel on a rich banquet that nature has provided for them when all other food is covered—another of the many wonderful lessons the naturalist reads in the great book of nature.

Holly.

To some it may appear superfluous to enumerate this tree, for though every body knows it as an ornamental, few know it as a timber, tree, yet our engravers for calico and paper printers use it in great abundance, as do millwrights &c. It grows best on gravel or shale mountain sides, and when so grown presents a most gorgeous object as a back ground to timber lands, its red berries being an especial object of interest to any birds in the district. It rarely suffers from insects after it bears berries, for the eggs or larvæ are taken by most birds in preference to its fruit. Its principal enemy is *Grapholita nœvana*, a small moth which deposits its eggs on the terminal shoots in July. In spring these eggs hatch; the larvæ spin the young leaves together, and live between them, eating the house they live in, and stopping all growth. It has also a dipterous parasite, if I may so express it, which lives between the two skins of the leaf, forming reddish brown or yellowish blotches, quite disfiguring the tree, but otherwise not of much consequence. Should a branch be broken from one of these valuable trees, *Anobium molle* steps in and, once its eggs are hatched, we may cross off the value of that tree when taking stock; for ever eating, killing the trunk as it eats and reproducing its kind, without even coming to the surface, we can

suggest no remedy for the ravages of an enemy so insidious. This tree rarely squares more than 9 inches, but, like boxwood, it is joined to make large blocks. In Italy and Spain it has another enemy, *Buprestes cupreus;* but I have only seen one English example of this tree-destroyer; it was taken at Accrington, and shewn to me by a friend; it proved one of the most interesting captures of the year (1860) to entomologists.

Apple.

It may be asked, why have I wasted so much paper about these trees which grow everywhere; therefore, I leave them long before they are exhausted, to endeavour to shew what injures our fruit-trees, commencing with our most generally cultivated fruit-tree, the apple. This tree is attacked by many insects and plants, all tending to rob it of its value. Its bark supports several species of lichens, which again support a number of insects. Thus, *C. lichenaria* lives upon *Evernia prunastri*, and several species of moss live upon it, which give food and habitation to insects; the genus *Tortula* supports *Crambus falsellus*, and *Griminia pulvinata* is house and home for *Eudorea muralis*. I have found a *Gelechia* larva amongst *Bryam capillary* on apple-trees; its bark harbours the *Coeox*, known as the American bug; aud its blossoms supply food to *Eupethecia rectangulata* and *Chematobia brumata* &c. Its leaves are eaten by a host—*coleopterous, dipterous* and *lepidopterous*—amongst the latter are some of our handsomest *Micro-lepidoptera*, including *Ornix guttea, Lyonetia Clarkella, Lithocoletes, Pomifoliella*, &c. Its fruit is eaten by *Capocapsa pomonana*, one of the handsomest Tortrices in our list, to say nothing of the *aphides* which so often attack and injure this tree, or of the web-spinning genus *Hyponameuta*, which in some seasons cover the tree with a net, as they uncover it of leaves. With all these enemies, it is not

to be wondered at that the apple is a precarious fruit in England; but when we consider that it has yet a greater enemy in man, who shoots, poisons or otherwise destroys its greatest and natural friends, the wonder is we ever grow an apple at all. In addition to these feeding upon it, *Trochillium myopæforme* and *Semasia Wæberana* live under its bark; the first-mentioned quite freeing the bark from the trunk, and so injuring the tree.

Pear Trees

Are less injured by insects than any other fruit trees; with the exception of *Corsus ligniperda*, they are free from timber-borers; but this species once in an orchard of Jargonelles it will require the most careful watching to save them. For want of this care, the whole of the once extensive and flourishing pear-trees around Warrington are now removed: lately they cumbered the ground where ten years ago they paid the rent; and the whole of the mischief might have been avoided by removing one or two trees at first, or by observing where the young larvæ were attacking fresh trees. This wood is very valuable as a timber for glass-maker's blocks, &c.; the glass at white heat scarcely burning it or making it blaze—its leaves are also little eaten by insects. Though on one occasion I saw a tree defoliated by the larva of *Dilula augustiorana*, yet, on the whole, we have little to fear from insects on pear-trees, except as above, so far as my experience goes, and I do not interfere with what may have been observed by others.

Plums.—Genus Prunus.

Various as are the plums of our orchards, they are all subject to the same enemies, from the gigantic *Magnum*

bonum, the delicate green-gage, and the sweet golden drop, to the sour and bitter bullace of our hedges. We look in vain for a species that is peculiar to one variety. Various *aphides* occur at different places; but they do not confine themselves to any particular variety. *Penthina pruniana* favours the sloe, the damson, the Halewood, as freely as it does any of our finer varieties, but rarely does perceptible injury. Smaller moths mine the leaves of plums; but I am not aware of anything which does much injury, except *aphides*, and they are generally confined to wall fruit, which can be syringed, or to close-growing trees which want thinning, or to the young shoots; then they speak plainly, this tree requires pruning, and to prevent a recurrence, the cuttings should be burnt.

Apricots

Have many enemies; *aphides* are well understood, and their remedy, syringing, is regularly practised. Let us, therefore, pass to the leaf-rolling *Tortricina*, amongst which *Lozotenia rosaria*, and *L. heparana*, do most mischief. The eggs are deposited about the end of June and July, they hatch in April and May, roll two or more leaves together, and tie them with a silk band, adding more leaves as they grow, and eating the foliage until it often happens that the tree is quite stripped of its leaves, and the fruit perishes. I cannot too strongly press upon the attention of gardeners the value of small birds, especially the Tits, for no eye but theirs can discover these eggs in winter; and they alone can extract the larva from between the leaves, when hatched, without injury to the trees. The Tits love to breed in any hole, especially in a garden wall. Any one neglecting to provide these holes for them behind his fruit-trees deserves to be disappointed of fruit. Let them once establish a colony in a garden, and besides the pleasure of having such lively and beautiful company

around him all day, the gardener will feel that his work is being done for him, whilst he looks on with a satisfaction unknown to him before. The birds unmolested, and in winter fed with a little meat of any kind, hung on a string near the holes, become so tame and attached to the place of their birth that he need never fear their leaving him until their food (insects) is scarce, and that, I presume, is what he is aiming at from day to day.

Cherry Trees

Require insectivorous birds more than any other tree. They are subject to the attack of *Penthina cynosbana* and *P. ochroleucana*, either of which defoliates the tree before the leaves have had time to mature their size. Both species are hatched in April, feed throughout May, and live between united leaves, which they eat. They attach other leaves to the ribs of the leaves already eaten; and as the foliage of the cherry grows in bunches, so each bunch is eaten by separate larvæ, until fruit alone remains. It may be asked, But what is so much eaten by birds as cherries? True, birds are fond of cherries, else why call the "merry" (the wild black cherry) "the bird cherry;" but as these birds have preserved to us a crop of fruit, are we not fairly called upon to pay the insurance? And as birds rarely touch cherries until they are dropping ripe, we, if so disposed, may cheat them of their due by gathering the fruit early.

Again, this tree has another enemy, *Hyponymeuta padi*, which spins its web all over the tree, especially on the large wild trees grown for last-makers in the lake district, and in some seasons, trees which will square from 18 to 24 inches, and which tower up with the oaks and ashes, are covered with what may well be taken for one great spider web, under which hundreds of thousands of a dirty-looking larva, half an

inch long, with small black dots upon it, may be found. If seen in June, the larvæ have turned into long white silk cocoons laid side by side, (pl. v. fig. H) from which, in a few days, a beautiful white moth emerges, having its wings dotted all over with minute black spots. This moth lays its eggs, becomes food for birds, spiders, ants, or dies a natural death. In any case it has perpetuated the mischief, or left food for our little songsters. Just as we the owners of the district destroy the birds, so the insects destroy our profit. Keep and protect the birds, remove injured parts of trees, smooth broken branches by cutting clean, destroy all trees now attacked by tree-borers. In most cases burn such trees, they are unfit for bearing timber, or even for rails, the larva now feeding on the small dead part has at once the whole dead timber to eat, if the wood is used, and sets to work right merrily; thus, we have so-called dry rot in our houses; and though it may take years to complete the work of destruction, yet it will surely be done. These *Malacoderma*, which seem so confined in their habits in a wood, only eating the dead branches of oak, ash, beech, sycamore, fir, elm, larch &c., once introduced into the building of a church, it is quite certain that that church will, eventually, be eaten by them. The most recent instance of this fact is that of Warrington church eaten by *Anobium nitidum*, *A. striatum*, and *Lasioderma testaceum*, and possibly by other species; but these were all I found on my journey to examine the old timber of which it was built.

In this paper, as in the one named in the first page of it, I have endeavoured to shew the value of birds on an estate. It may be that, loving birds as I do, I have over-drawn their value; but these notes are the result of careful study of the food and habits of birds, and a thorough knowledge of insects and their life history, together with a little knowledge of our glorious old English woods, and of their timber as a market-

able article, and are the result of years of careful observation made both where sparrow heads are paid for by parish officers, and where small birds are fostered and protected in gardens and plantations. Whatever may be thought of the conclusions arrived at, they are the convictions of one who hopes or expects nothing for his labour but that those who have used poisoned grain so freely and so effectively, or otherwise destroyed their feathered friends, will cease to do so for a few years, and watch the result: after that he fears nothing for the children of the air.

Without a book from which to cull one remark on this subject, all errors of judgment, if any, must be attributed to the writer.

Explanation of Plate V.

A.—Birch bark mined by *Trochillium scolæforme*, shewing the Larva *in situ*, and the hole it makes when the perfect insect escapes.

B.—The Larva, three-quarter size.

C.—Pupa, full size.

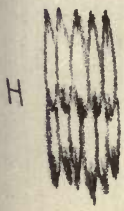
D.—Cocoon, full size.

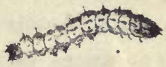
E.—Tracks made by the Larva in the soft part of the bark.

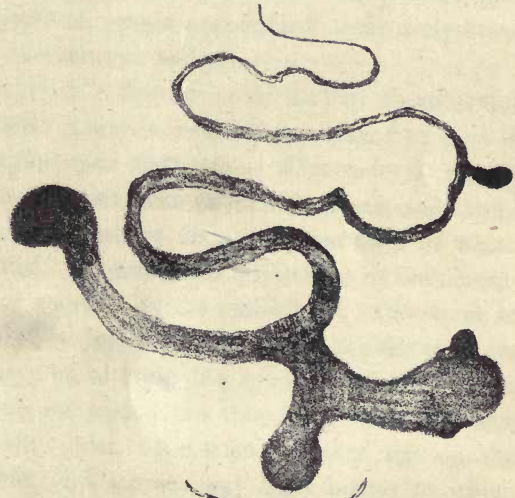
F.—*T. scolæforme*, female.

G.—Pupa of *B. fraxini* (?) *lunatus*.

H.—Cocoons of *H. padi*.







C.S.C.

ON THE APPLICATIONS OF ELECTRICITY.

By E. B. Bright, F.R.A.S.

(Read February 12th, 1863.)

In selecting, as the subject of the present paper, the many uses to which electricity has already been applied for our benefit, I am obliged, by the brief limits to which I am confined, to pass in rapid review many of those applications which have become familiar to us, in order to devote more space to inventions comparatively recent and novel.

Few, perhaps, are fully aware how extensively electricity enters into our every-day life, or that at the present time probably fifty thousand people are earning their daily bread through its use in commerce and art.

Before entering upon a description of the various apparatus by which this subtle power is turned to account, I propose to pass a few remarks upon its nature. Electricity is simply force existing in a latent form in all substances, and shown to us when we decompose or disturb the particles of which they are constituted. In practice it is obtained by the decomposition of air or water. By the well-known experiment of rubbing a piece of sealing wax with a silk handkerchief we produce electricity, by altering the relations of the oxygen and hydrogen gas composing the thin layer of air between the silk and sealing wax. Electricity is thus left on the surface of the wax and attracts any light bodies to which it is brought near. This form of electricity is, however, too volatile and evanescent to be turned to practical account. It is from the decomposition of water that we obtain the electricity of commerce, if I may so term it. Dissimilar

plates of metal being placed in a vessel containing water slightly acidulated, and the upper part of the plates linked together by a piece of wire, the oxygen of the water is absorbed by one metal and the hydrogen given off at the other—a current of electricity flowing through the wire between the plates as a consequence of this chemical action.

The transmission of electricity through a conducting wire may be likened to that of water through a water-pipe—if there is a leak at any point, it escapes; and as the earth is a general reservoir of electricity, it is necessary to interpose non-conducting substances, such as glass, earthenware or gutta percha, between the wire and the ground when we wish the current to pass to any considerable distance. Electricity also resembles, in a measure, steam or gunpowder. If we desire to obtain powerful effects we must compress it by passing it through a conductor of limited size or imperfect conductivity. Magnetic or chemical action then results. If we squeeze the current still more, it assumes the form of heat; and if it has to pass through a layer of air, offering further resistance to its passage, the electricity, Proteus-like, becomes light.

From these phenomena we obtain various practical results. I will first refer to the magnetic effect of the current. To this we owe the telegraph in most of its forms, from the early instruments of Cooke and Wheatstone, in which the alphabet was formed by movements of a suspended magnetic needle, to the various telegraphic systems now in operation—comprising signalling by sounds produced upon muffled bells, of different pitch, by the attraction of light hammers on the passage of the current through coils of wire; signalling by means of marks in cypher, made upon paper; and, lastly, by printing the ordinary form of letter upon a riband of paper. Probably all present will be acquainted with the various forms of telegraphic apparatus, and I need only mention that for

general use it is found that the simpler the apparatus is the better. If we endeavour to print each letter of the alphabet in its ordinary character we can only do so by complicated and expensive apparatus, and at a rate not practically exceeding that attained by the more simple methods. For use between offices and warehouses at a short distance, a variety of telegraph instruments have been designed, in all of which an index hand or pointer is carried round a dial on which the alphabet is printed—pauses being made at each letter signalled.

The magnetic action of electricity has also been applied as a motive power, with the object of superseding the steam engine; but although great attractive strength can be obtained, the cost has hitherto been too great to admit of its successful introduction, unless in connection with small machines, such as lathes. M. Froment of Paris uses it to work the apparatus by which he cuts microscopic scales, the electric current being applied to turn on the dividing machine in the middle of the night; when the tremour of the ground, consequent upon vehicles passing, has ceased. By this means the attendance of workpeople is rendered unnecessary and the delicacy of the work not interfered with by vibration.

It is in submarine telegraphy that we are to look for the greatest and most useful results as regards communication between distant points of the earth's surface. Seas divide one land from another, and it is by this invention that the means of intercourse are given to the various families of the human race. The principle of a submarine telegraph is simply coating a wire of a good conducting material, such as copper, with a substance impervious to water and electricity, such as gutta percha. In order to protect the gutta percha envelope from injury when coiled away in the vessel, and during or after submersion, various outer coverings, such as spiral wires, hemp and steel wire, hemp etc., have been devised, some with the

view of lessening the specific gravity of the cable, so as to obtain increased facility in laying. It has, however, been found in practice that a considerable weight is requisite to make the cable assume promptly the irregularities presented by the bottom, and to avoid the lash of the waves in paying out. It is also found that a mere covering of hemp is liable to destruction by various marine animalculæ, and that a metallic casing is requisite. It has been assumed by many not conversant with the details of such operations, that the weight of the Atlantic cable presented special difficulties in submersion, but such is far from being the case. The difficulty in laying a submarine cable in very deep water arises from the grip of the water upon the cable, owing to the friction of such a great length of line between the surface and the bottom. If the sea is quiet no danger is incurred from this, but if it is rough, the rise and fall of the ship have to be compensated by machinery on board, as the friction will not allow the cable to be drawn quickly out of the sea to meet the ship's motion.

In order to protect cables further from decay, through rust and the attacks of marine insects, an outer wrapping of yarn saturated with pitch tar, and pulverised silica has been introduced by Sir C. Bright and his partner Mr. L. Clarke, who are now carrying out the construction of the Persian Gulf line of telegraph which, as soon as extended between Kurrachee and the heads of the Persian gulf and thence to Bagdad, will unite this country by wire with Hindostan and eventually with Australia and China.

I have now to call your attention to the mode of discovering the position of faults, if any arise, in submarine lines. It is obvious that if a cable fails, the nearer the locality of the fault can be determined, the more readily will the communication be restored. It is well known that the resistance to the passage of the current increases with the diminution of the

conductor ; so that a hundred yards of very thin wire may offer as much resistance, as a mile of the thicker wire used for the conductor of the cable. Thus we may have a measure in a small compass of any line of telegraph, and by offering the electricity from a battery the choice of passing through the cable, and also through series of lengths of thin silk-covered wire wound upon bobbins ; and by subsequently increasing or diminishing the lengths of the latter, until the electricity passes equally through both the cable and the standard coils, the precise distance of the leakage may be determined.

The many services the telegraph now renders scarcely need any illustration at my hands ; but, before passing from this part of the subject, I may refer to the weather prognostications and storm cautions recently introduced by Admiral Fitzroy and the Board of Trade, as the basis of the plan may not be well understood and it is desirable these forecasts should not be looked upon as empirical, like those of the weather prophets of years gone by, but as derived from scientific results, the deductions from which will be rendered every year more certain. A set of meteorological instruments, consisting of a barometer, wet and bulb thermometers etc., is placed at each of a number of places round the coasts of Europe, that are joined together by telegraph. The apparatus generally is in charge of the telegraph staff at the various points selected ; and every morning and afternoon, messages are sent from all these points giving the height of the mercury in the barometer and thermometers, the direction and strength of the wind, the condition of the sky, state of the weather, and amount of sea disturbance, if the station is actually on the coast. Thus an approaching change of the wind or weather is telegraphed beforehand, perhaps from a distance of a thousand miles, and the advent of a storm signalled onward by station after station. Now, although the rotary motion of a storm may be exceedingly rapid, its onward progress as a whole may not exceed a

few miles an hour and, being first indicated by the fall of the barometers etc., on the west coast of Ireland or south of France, it may not reach the east coast of England for a day or two after, when shipping have been warned by cautionary messages.

We all place some faith in the admonitions of a barometer but how much more certain does an inference drawn from its reading become, when corroborated by simultaneous readings of many other instruments spread over the world. The further the telegraph is extended, the longer will be the period of forecasting; and when, as will shortly be the case, America, Hindostan, China and Australia are linked by the wires to Europe and Africa, the pulsations of the weather will be signalled days beforehand all over the globe, and a vast meteorological system carried on by telegraph.

The objection has been raised that mariners may be made unnecessarily fearful of venturing to sea by these warnings of an approaching storm, but surely this is not probable. All captains consult their ship barometers to judge of coming weather, as well as they can, in their own immediate vicinity, and how much better is it to be furnished at the same time with the condensed result of a vast series of observations. Forewarned on board ship is forearmed; and, if a captain sails knowing the approach of bad weather and the quarter from which it is coming, he can get well clear of land and have everything ready on board to meet a storm.

The following are instances of the advent of dangerous storms having been signalled to our ports during the past six months, which I have extracted from the *Shipping Gazette* and the records of Lloyd's, kindly placed at my disposal by Mr. Court, Secretary of the Liverpool Underwriters' Association. The nature of Admiral Fitzroy's cautionary messages is attached in each case.

Admiral Fitzroy's Warning Signals.	Subsequent Weather reported.
Sept. 13, 1861.—Cone, point down	13th to 15th. Liverpool—heavy gale.
„ 20, „ —Drum indications, S.W., Ireland	22nd and 23rd—S.W. Fleetwood, Whitehaven—hurricane. 23rd. Liverpool, 16lbs. to the square foot.
„ 24, „ —Drum and cone down	24th. Dover—gale, W.S.W. 25th. Dartmouth—S.W., gale. 27th. Falmouth—S., violent gale. 27th and 28th. Liverpool—11 to 14lbs. to the square foot.
Oct. 11, „ —11 a.m. Cone down	11th. Galway—gale, S. 11th and 13th. Holyhead—strong gale, S. to S.W.
„ 11, „ —11 p.m. Cone up over drum	12th. Fleetwood, Milford, and (13th) Plymouth—hard gale. Liverpool also records 11lbs. to the square foot.
Dec. 4, „ —6.30 evening. Cone point down	4th—night. Milford—gale for a few hours. Liverpool, 6½ lbs. to the square foot.
„ 6, „ —Hoist drum	7th. Cardiff—gale from W.
„ 7, „ —Hoist drum	8th. Milford—S.W. gale. 9th. Milford—strong gale, thunder and lightning. 7th. Liverpool, W.S.W.—19lbs to the square foot.
„ 13, „ —Hoist drum	12th and 13th. Penzance, S. 14th. Shields, N.W. 13th, 14th and 15th. Liverpool (15th, 13lbs. to the square foot.)
Jany. 9, 1862.—Drum and lights	10th and 11th. Gale, Liverpool—11 to 14lbs. to the square foot.
„ 11, „ —Cone over	11th. Cardiff; Port William—gale and hurricane. 12th. Holyhead—gale.

N.B.—The cone signals the probable direction of the wind. If upwards from the N. If down from the S. The drum indicates unsettled or veering gales.

[The Author then gave brief explanations, from diagrams and models, of the application of electricity to plating with silver, &c. ; lighting ; weaving in substitution for the Jacquard loom and cards ; regulation of clocks ; indicating targets &c.]

ORIGINAL LETTER, GIVING A CONTEMPORARY RELATION OF THE DEATH OF CHARLES II.

Communicated by Lieut.-Gen. the Hon. Sir Edward Cust, President.

(Read 13th March, 1862.)*

The very interesting picture on this subject, by the Royal Academician, Ward, that has been exhibited during the past season in London and Liverpool, has brought the circumstances attending the death of Charles II so prominently before us, that an original letter found in the library of Simon Yorke, Esq., of Erddigg Park, may be an inducement to the Historic Society to enter into the subject, although the manuscript is no more than an account of the king's death, as current in the capital the day afterwards.

"No transactions in history ought to be more accurately "known to us than those which took place round the death-bed "of this sovereign. We have several relations extant, written "by persons who were actually in the room; we have several "relations written by persons who, though not eye-witnesses "themselves, had the best opportunities of obtaining informa- "tion from eye-witnesses; yet whosoever attempts to digest "this vast mass of materials into a consistent narrative, will "find the task a difficult one."

These are Macaulay's words; but he has executed the task himself in his own eloquent and concise language, and we have besides the narrative of Rapin, Hume, Bishop Burnet, Lingard and Miss Strickland, all which nearly agree together in the main; and the letter of John Edisbury to his brother, the squire of Erddigg, is also corroborative of the principal circumstances. The manuscript runs thus:—

Dear Brother,

Upon Friday a quarter before 12 the king resigned his soul to Almighty God. A little before he dyed the room was cleared

* Vol. II., N.S., p 187.

only the Duke the E. of Bath and another lord What was said I cannot hear, only the king gave him the Duke his breeches and told him there were papers that concerned him in his pocket and gave him the key of his closet. Some while before he mentioned his 2 sons that were unprovided for. I cannot hear that he mentioned the D. of Monmouth in all his sickness to the Duke or any that waited upon him. The king altered about 2 on Thursday and since that time there was little hopes. Blessed be God he kept his understanding all the while till 3 hours before death, and most of those 3 hours at intervals. The queen is in great perplexity and all her servants. A little before the k's death the queen sent to ask him pardon for all her faults the k. said he knew only his own for which he asked her pardon.

All things God be praised in a great calm the Duke proclaimed about 4 o'clock : there first went a troop of grenadiers, then all the heralds and the principall gave my Lord Mayor the reason of this attendance there was read the enclosed proclamation subscribed by the Council and lords after the heralds came the queen's coach, then the Archbps, Ld Kepers, Presidents Privy Seal, Dukes, Earls, &c. But I am much mistaken for after the troop of grenadiers came a full troop of the guards, abt 200, then before the heralds came the messengers [*sic.* in original] and so on as I said before. After the king's death the Duke came to the counsell and spoke to them after this sort. My lords now the crown is descended upon me. I do declare I will never alter the government as it is now established in Church and State and I will sacrifice the last drop of my blood to maintain the protestant religion and as far as in me lys I will follow my late brother's example.

I hear this is to be at large in a declaration which my Ld Keper and Privy Seal are to draw this up for the people. I have enclosed 2 proclamations, and I will send you the other as soon as I can get it. The words are sent by Harrison. I have nothing more as I remember, I am

Your loving brother,

Feby 7 JOHN EDISBURY.

I forgot to tell you the king expressed a great deal of kindness toward the Duke.

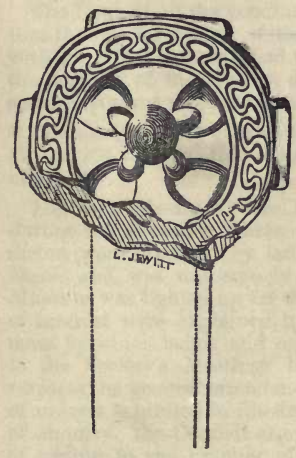
Addressed— These
for Josua Edisbury, Esq.,
Erthigg near
Wrexham,
Endorsed— Denbighshire.

K. Charles dyed
Feb 1684.

THE HILBRE CROSS.

By the Rev. A. Hume, D.C.L., Hon. Secretary.

THAT there was a cell of Monks at the little islet known as Hilbre, (or St. Hildeburgh's isle,) for several centuries, is well known, but the period of its origin is not stated. In all probability, however, it existed during the reigns of our Saxon monarchs, when Deva or Westchester was a place relatively much greater than it is at present. In 1120, a monk of this cell is said to have advised the adoption of the course by which the constable of Chester was enabled to pass the mouth of the Dee without ships; and when the pathway was round the coast, Hilbre was a place of some note. On Camden's map, a cross is represented as erected on the island; and, considering the veneration attached to this emblem from the earliest times, it is not unlikely that it had existed for several centuries. When the religious associations of the place were rudely dispersed, the cross no doubt disappeared. It could not easily have been removed, and no one would care to carry it away. About ten years ago the head of a cross, nearly perfect, was dug up in the island. Its type is Saxon; it is of the red sandstone of the district; and it measures 23 inches across. After lying for several years at the Dock office in the Custom House, it came into my possession, and has been engraved. It is morally certain that it is the identical cross which was hallowed by the



The Hilbre Cross.

associations of centuries, which was visited by pilgrims, and which exhibited to landsmen and mariners the symbol of Christianity during the most barbarous and troubled periods. It has been thought that a local relic of so much interest should be figured and briefly described in one of the volumes of this society. It has been given in the volume entitled "Ancient "Meols," which describes the extinct settlement in the immediate neighbourhood of Hilbre, on the sea coast of Cheshire.

PROCEEDINGS.

FIFTEENTH SESSION, 1862-63.

ANNUAL GENERAL MEETING.

Free Public Library, 18*th October*, 1862.

ALEXANDER CRAIG GIBSON, F.S.A., CURATOR, in the Chair.

The SECRETARY read the following

REPORT.

The Council, at the conclusion of their year of office, have to report that the regular course of the Society's proceedings has been pursued with the usual success; and they retire with the confident feeling that the position of the Society, during the period of their service, has, in some important respects, been materially improved.

The total number of members on the roll of the Society is 420; viz., 57 *life*, 183 *resident*, 152 *non-resident*, 2 *lady associate*, and 26 *honorary* members.

Eighteen Meetings were held, at which twenty Papers were read during the Session. Three of the Meetings, of a more popular character, were attended by ladies; the last partook of the nature of a *Soirée* and was numerously attended. On that occasion the Derby Museum was lighted up for the first time and some of the chief objects of interest were explained by Mr. Moore, the Curator. The arrangement by which ladies and other non-members are occasionally invited to the Society's Meetings has proved to be advantageous both as respects the general attendance of Members and the variety and interest of objects exhibited in illustration of the Society's three great subjects of enquiry; the Council also think it likely that it may be the means of adding to the number of lady-associates, and recommend its continuance.

In their last Report the Council had pleasure in acknowledging the kindness of the Town Council, through their Library Committee, in granting to the Society the use of a suitable room in the Free Public Library, for the purpose of holding its Meetings. That accommodation has been increasedby additions since made to the comfort and elegance of the room. Hitherto the Library and Museum have been comparatively inaccessible to the Members generally, owing to the difficulty of approach and uncertainty of attendance at the room in Ranelagh Street where they were placed; but during the year just expired accommodation has been provided for these alsowithin the Free Public Library. The Museum and miscellaneous objects, in four large cases, occupy a separate apartment; and, to receive the books, a very elegant and commodious book-case has been purchased, at a cost exceeding £100. Although this is a large sum, the Council felt justified in expending it, trusting that voluntary contributos would reimburse the Society, in a great part, if not all, of the amount. In this manner a portion of the outlay has already been repaid and the Council expect further contributions from other Members, before whom the subject has yet to be brought. They have great pleasue in acknowledging the kindness of some gentlemen, not Members of the Society, who have shewn their sympathy in its pursuits by assisting in this purchase.

Donations of their published Transactions and Proceedings have been received during the past Session from several Provincial learned Societies with which this Society had not previously been in union; and an effort to complete various imperfect series of such volumes has been partially successful. The fourteenth annual volume is expected to be ready for delivery about Christmas, when the plates necessary to complete the last will also be supplied.

As the new volume is not wholly printed off, the Council deem it prudent to recommend the postponement of the Treasurer's balance sheet for a short time; they are, however, in a position to state that a balance in their favour, not less in amount than that of last year, may be expected when the accounts are formally produced.

The Delegates nominated by the Society to co-operate in the management of the Gallery of Inventions and Science are unable to report that satisfactory progress has been made towards the fulfilment of the duties imposed on them. The expressed inability of the Library and Museum Committee of the Town Council to contribute funds for defraying the cost of management appears to render hopeless, for the present at least, the accomplishment of the principal design. This impediment is the more to be regretted as the closing of the Exhibition at the end of the present month would, under more favourable circumstances, have afforded ample opportunity to establish the proposed collection on a promising basis.

The names of six new Sectional Members of Council, and of a Vice-President, in lieu of those who retire, are submitted, agreeably to the laws, in the printed balloting lists.

COMPARATIVE ACCOUNT OF THE NUMERICAL STRENGTH OF THE SOCIETY.

	Life.	Resident.	Non-Resident.	Lady Assoc'tes	Total.	Honorary	Gross Total.
Session XIII	52	185	150	2	389	27	416
„ XIV—Died, resigned or erased ..	1	11	7	..	19	1	20
	51	174	143	2	370	26	396
New Members	6	9	9	..	24	..	24
	57	183	152	2	394	26	420

It was moved by the REV. THOMAS MOORE, A.M., seconded by JOHN R. JAGO, Esq., and resolved unanimously,—

That the Report now read be adopted, and printed and circulated with the Proceedings of the Society.

It was moved by THOS. READY, Esq., seconded by WM. MATHISON, Esq., and resolved unanimously,—

That the thanks of the Society be given to the Officers and Sectional Members of the Council for their services during the past Session.

It was moved by the REV. A. HUME, D.C.L., Hon. Secretary, seconded by WILLIAM BURKE, Esq., Treasurer, and resolved unanimously,—

That the thanks of the Society be given to the Town Council and their Library and Museum Committee for their liberality and kindness in affording accommodation in the Free Public Library and Museum for the books and other collections of the Historic Society of Lancashire and Cheshire.

It was moved by JOHN G. JACOB, Esq., seconded by the REV. THOMAS MOORE, A.M., and resolved unanimously,—

That the thanks of the Society be given to those gentlemen who have contributed Illustrations to the forthcoming volume.

A ballot having been taken for the Officers and Sectional Members of Council, the result was announced from the chair. (See p. iv.)

It was moved by the REV. A. HUME, D.C.L., seconded by J. G. JACOB, Esq., and resolved unanimously,—

That this meeting do now adjourn to the 14th of May next, for the purpose of receiving the Treasurer's Statement of Accounts.

At the adjourned Annual General Meeting, held at the Museum of Antiquities, No. 8, Colquitt Street, on the 14th May, 1863, A. Craig Gibson, F.S.A., presiding, the Treasurer submitted the following Statement of Accounts for the year ending 18th Oct., 1862 :—

THE HISTORIC SOCIETY OF LANCASHIRE AND CHESHIRE *in account with* WILLIAM BURKE, *Treasurer.*

Dr. *Cr.*

	£	s.	d.	£	s.	d.
I.—THE VOLUMES:—						
Balance delivery Volume I, N.S., and new block	2	10	0			
Printing and binding Vol. II, N.S.	79	13	4			
Illustrations, ditto.....	9	2	0			
Delivery	4	13	6			
				95	18	10
II.—SESSIONAL EXPENSES:—						
Printing Circulars, &c.....	11	5	6			
Stationery.....	1	0	6			
Postage Stamps	11	10	5			
Refreshments at meetings	11	8	0			
Advertisements, delivery of circulars, messages, parcels, & miscellaneous	15	12	4			
Insurance.....	1	0	0			
Rent of Room in Ranelagh Street.....	16	0	0			
Commission to Collector..	5	10	0			
Assistant Secretary	50	0	0			
				123	6	9
III.—PERMANENT INVESTMENTS:—						
Papworth's Ordinary, and Gore's Directory	1	9	9			
Large book-case for library.	101	0	6			
Small book-shelves	1	11	11			
				104	2	2
IV.—SPECIAL EXPENSES:—						
Removal of cases, books, objects &c.	4	18	1			
Expenses in connection with purchase of large book-case	0	14	6			
				5	12	7
Balance in Treasurer's hands.....				33	14	7
				£362	14	11

	£	s.	d.
By Balance from last Account	25	11	4
By Receipts in Session xiv, viz:—			
Arrears	20	9	6
Entrance Fees, Session xiv	13	13	0
Annual Subscriptions, ditto	214	14	6
Ditto (in advance) Session xv	4	4	0
Life Compositions.....	36	15	0
Books and book-covers	6	9	6
Postages returned	0	4	1
Diplomas	0	4	0
Removal Fund; towards book-case purchased.....	37	16	0
Sale of Furniture	2	14	0
	£362	14	11

Balance down..... £33 14 7

Examined by
PETER R. MCQUIE,
SAM. GATH,
} AUDITORS.

(E. and O. E.)
Liverpool, 27th April, 1863,
WILLIAM BURKE.

It was moved by PETER R. MCQUIE, Esq., seconded by BELL WILLIAMS, Esq., and resolved unanimously,—

That the Treasurer's Statement of Accounts be passed, and printed and circulated with the Proceedings of the Society.

6th November, 1862. ARCHÆOLOGICAL SECTION.

THOMAS DAWSON, Esq., in the Chair.

The following gentlemen were duly elected Ordinary Members of the Society:—

George Stone, 57, Ranelagh Street.
William Whatham, 7, North John Street.

The following donations were presented:—

From the Society of Antiquaries.

1. Archæologia, vol. 38, part ii.
2. Proceedings, N.S., vol. i, Nos. 2 to 7.

From the Royal Society of Northern Antiquaries.
1. Antiquarisk Tidsskrift, 1858-60, parts 1 and 2.
2. Mémoires de la Société, 1850-60, 1 vol.
3. Det Kongelige Nordiske Oldskrift-Selskab, 1860-61.

From the Author.
Inscriptions runiques du Slesvig méridional, interprétées par C. C. Rafn, 1861.

From the Norfolk and Norwich Archæological Society.
Views of the Gates of Norwich, made in the years 1792-3.

From John Peacock, Esq.
1. Three sheets, containing copies of coins recently disinterred in the neighbourhood of St. John's Church, Chester, supposed to be the foundation-coins of that edifice.
2. A broadside, containing an account of the above, as delivered before the Chester Archæological Society.

From the Chairman.
1. Map of Manchester in the year 800.
2. Map of Saxon London, about 1000 A.D.

The following objects of interest were exhibited :—

By the Rev. Dr. Hume.
1. A Chinese cross-bow, surmounted by a receiver from which six arrows drop in succession into the position for being discharged. This is accomplished by a simple movement of part of the bow, without removing it from the shoulder.
2. Specimens of Burmese, Chinese, Moorish, Canadian and other shoes, illustrating the habits and necessities of the respective wearers.

By Mr. Newton.
1. A richly-illuminated French MS. "Book of Hours" of the 15th century.
2. A small framed picture, cut from a similar MS., representing the performance of the rite of extreme unction at the bedside of a dying Flemish burgher of the 13th century.

By Mr. Burke.
A specimen of the Gulf-stream weed.

The following Paper was read :—

On the forms and uses of Tintinnabula in Mediæval and Modern Times, *by the Rev. A. Hume, D.C.L., Hon. Secretary.*

The existence of bells at an early date was deduced from Scripture; and the difference was noted between them and the sacred hand-bells of the mediæval period. Their material and shape, in various ages and countries, were described; and an interesting account was given of their numerous uses, amongst which are their employment to decorate the dress of the clown or jester; as pendants to the rings worn round their ankles by the women of Persia and Arabia, as mentioned by Sir John Chardin; as portions of the dress of the morris-dancers of Old England; and at the *festa fatuorum*, or fools' festivals, in which

the superior clergy changed places for the time with the humblest people, and the latter, as Abbots of Unreason &c., had bells attached to their mock-priestly robes. The bell was used as a sacred symbol by the clergy and, it is said, by the Druids; it also formed an article of personal adornment for ordinary apparel. It is found depicted on monumental brasses, and was used on the harness of horses as early, at the least, as the time of Zechariah. The paper contained, in detail, instances of the similar use of bells from that period down to the present age; and proceeded to notice the ceremony of "belling the cat" and the distinction of "bearing the bell." Hawks' bells, the beggar with his bell, and bells on the arms of warriors were adverted to; the ceremony of excommunication by "bell, book and candle" received mention; and the paper concluded with a particular account of the bells found at Hoylake.

Ancient Crotal, or Pear-shaped Bell.

13*th November*, 1862. LITERARY SECTION.

Rev. A. Hume, D.C.L., in the Chair.

At this meeting the attendance was increased by an invited company of non-members and ladies.

The following donations were presented:—

From the Literary and Philosophical Society of Manchester.
1. Memoirs, third series, vol. i, 1862.
2. Proceedings, vol ii, 1862.
2. Rules, 1861.

From the Liverpool Royal Institution.
Report for 1861-62.

From the Liverpool Naturalists' Field Club.
Report for 1861-62.

From the Author.
An Account of the Colony of South Australia. With a Catalogue of all the Products of that Colony exhibited at the International Exhibition, 1862. By Frederick Sinnett.

The following Paper was read:—

A Summer Saunter in the South of England, *by David Buxton, F.R.S.L., Hon. Librarian.*

20*th November*, 1862. SCIENTIFIC SECTION.

J. T. Towson, F.R.G.S., in the Chair.

The following donations were presented:—

From the Royal Society.
Proceedings, Nos. 49 to 51 (vol. XII.), 1862.

From the Geological Society.
Quarterly Journal, parts 2, 3 and 4 (vol. XVIII.) 1862.

The following objects of interest were exhibited :—

By Mr. Forrest.
1. Four life-size portraits, enlarged from a quarto plate negative, by Woodward's Solar Camera as improved by Mr. John Atkinson.
2. A Solar Camera, by means of which the exhibiter shewed how enlarged portraits are produced.

By Mr. Towson.
1. A Daguerreotype produced by a non-achromatic glass in 1842.
2. A miniature photogram on ivory.

By Mr. Newton.
Various maps and prints, shewing the application of photography to the production of enlarged or diminished copies of such works.

By Mr Burke.
1. Diploma of doctor of laws, granted by the University of Bologna in 1753.
2. Speech of the Earl of Macclesfield in the House of Lords, 18th March, 1750, on regulating the commencement of the year.
3. The Mariner's Everlasting Almanac, Aberdeen, 1683.
4. Vox Uraniæ, or Aberdeen Almanac, 1683.
5. The London Daily Advertiser, 14th November, 1734.
6. Articles of Union as passed, with Amendments, by the Parliament of Scotland. London, 1707.

The following Paper was read :—

On Panoramic Photography, with Illustrations and Models, *by Thomas Sutton, B.A.*

This Paper was read, in the author's absence, by Mr. Forrest, who exhibited and explained the apparatus employed; it consists of a circular glass, by means of which an angle of 90° is obtained, instead of the usual angle of 30 or 40°. Two pictures, one taken in the ordinary way and one by the means now shewn, were laid on the table. The latter contained about three times the customary extent of view; but was as perfect in the remote portions as at the centre. Several pictures, taken in the neighbourhood of Bath, by the process described were also exhibited.

4th December, 1862. ARCHÆOLOGICAL SECTION.

John F. Marsh, Esq., in the Chair.

The following gentlemen were duly elected ordinary members of the Society :—

Right Hon. Viscount Cranborne, Childwall hall.
Lieut.-Col. V. A. King, Point of Ayr, Oxton.
Thomas Goodier, 9, Lord street.
John Henry Green, Buenos Ayres.

Rev. W. T. Barry, B.A., 19, Lansdowne place, Everton.
C. J. Ashfield, 51, Knowsley street, Preston.
John Anderson, 42, Bold street.

The following donations were presented:—

From the Essex Archæological Society.
Transactions, vol. II., parts 2, 3 and 4.

From the Société Archéologique de l'Orléanais.
Bulletin, No. 40, 1862.

From the Kilkenny and S.E. of Ireland Archæological Society.
Proceedings and Papers, vol. IV., N. S., Nos. 35 to 37.

The following objects of interest were exhibited:—

By the Chairman.
Specimen of a plough in modern use in Spain.

By Joseph Mayer, F.S.A. &c.

A large glass tumbler or beaker, the lower part fluted and left as it came from the mould, the top having a border engraved with trefoils and leaves in compartments, a space being left on which are engraved the characters N. O. ii. It formerly belonged to Mrs. Unsworth, of the Manor House, Maghull, whose father, Thomas Seel, Esq., of Liverpool, died at the age of 77 in 1802. He received it from his grandfather, who died in 1751. The family of Seel were strenuous supporters of the Stuarts during the Civil Wars and the Commonwealth. It is supposed that the engraved characters signify "No Oliver the Second," a favourite toast of the cavaliers.

2. A photographic view of "El Sakhra," the Holy Rock under the dome of the Mosque of Omar, in the ancient temple of Jerusalem, taken by the Rev. Dr. Turner, of the Liverpool Royal Institution. The Holy Rock is believed by all the best authorities, except Mr. Fergusson, to be the site of the Sacrifice of Abraham and of the Holy of Holies in the temples of Solomon and Herod.*
3. By the kindness of Mr. H. Beckwith, Tower Buildings, five very rudely cast silver figures, apparently idols found near Lima; they closely resemble two silver figures engraved in vol. I., N.S.

By Mr. J. J. Hall.

1. A large bronze model of the Temple of Theseus.
2. A copy of the Medicean Vase, made of the pith of the elder.
3. A dagger, said to have belonged to Tippoo Sahib. It is in the form of a creese, and the scabbard is set with diamonds and rubies.
4. Two daggers; a pirate's knife; three Indian war implements; an Indian bow.
5. A sword, with leather case, elaborately ornamented with the colours peculiar to the people of South Africa.
6. The head dress of an American Indian, composed of feathers and shells.
7. Two curious books of the early part of the sixteenth century.

---

* The reasons for deeming it the scene of the Crucifixion are given by the Hon. Sir Edward Cust, President of the Society, in vol. X.; *vide* pp. 131 *et seqq.*

8. An iron chest, said to have been presented by the Great Mogul to Sir William Norris of Speke, when he was sent to the Porte as Ambassador about the year 1690. A history of its transmission, written since 1812, accompanied it; but on one point its accuracy was open to question.

By Mr. F. J. Jeffery.

Four specimens of photo-zincography, published in 1858, under the name of "Photoglyphs," in the *Photographic News*, by Mr. Fox Talbot, the patentee.

By Dr. Macintyre.

A photogram of one of the Roman altars found at Chester in 1861, and recently described by Mr. Roach Smith in the *Collectanea Antiqua*. It bears a votive inscription to the goddess Minerva.

By Mr. J. H. Gibson.

Fifteen silver coins found at Cawthorne, near Doncaster. They have been supposed, by a writer in the *Numismatic Chronicle*, to belong to the reign of Henry III.; but reasons were advanced to shew that they were of the second mintage of Henry II., and issued in 1182.

By Mr. John Peacock.

Drawings, on a large scale, of seventeen rare Saxon coins lately found in the neighbourhood of St. John's Church, Chester.

The Rev. Dr. Hume read a brief account of belts and girdles in continuation of previous papers* on the same subject.

The following Paper was read:—

On Virgil's Plough, as illustrated by a rude implement in modern use in Spain,† *by John Fitchett Marsh, Esq.*

11*th December*, 1862. LITERARY SECTION.

John R. Hughes, Esq., in the Chair.

The following donations were presented:—

From the Statistical Society.
Journal, vol XXV., parts 2 and 3.

From the Société Impériale d'Emulation d'Abbeville.
Mémoires, 1857 to 1860.

The following objects of interest were exhibited:—

By Mr. Mathison.

1. An ancient sword, the hilt ornamented with gold in the Oriental style.
2. An iron casket, apparently of English manufacture, of the fifteenth century.
3. An iron casket, of Italian workmanship, of the 14th-15th century.

---

* Vol. II., N.S., p. 129. † Transactions, p. 1.

4. A Cologne-ware jug of the 16th-17th century.
5. A Spanish copper lustre vessel of the 16th century.
6. Book of Hours, printed on vellum, with illuminations; date, early part of the 16th century.

By Mr. Fabert.

1. A complete series of the silver and copper coins now used in Russia.
2. A Russian coin in platina.
3. Seven bank notes of various Russian provinces, ranging in value from 1½d. to 3s.

By the Rev. Dr. Hume.

1. Two heraldic MS. books, compiled with great care by Mr. John Tocke in the year 1700, and preserved in the library of the Herbert family.
2. A British man-of-war under full sail, worked in worsted by a seaman of H.M.S. *Majestic*, during her late Summer cruise.

The following Paper was read:—

On the Life and Writings of Schiller,* *by the Rev. Hermann Baar, Ph.D.*

18*th December*, 1862. SCIENTIFIC SECTION.

Thomas Dawson, Esq., in the Chair.

Thomas Somerville, LL.D., Hawthorn Hall, Manchester, was duly elected an ordinary member of the Society.

The following donations were presented:—

From the Royal Society of Edinburgh.

1. Proceedings, Session 1861-62.
2. Transactions, vol. XXIII., part 1.

From the Royal Geographical Society.

1. Journal, vol XXXI.
2. Proceedings, vol. VI., Nos. 3 and 4.

From the Liverpool Chemists' Association.

Annual Report, 1861-62.

The following objects of interest were exhibited:—

By Mr. J. R. Hughes.

An interesting record in MS. relating to smith's and iron work in Liverpool during the last century.

By Mr. Jacob.

An elaborate model in ivory of the *St. George*, line-of-battle ship of 120 guns; valuable as illustrating the old naval architecture.

By the Rev. Dr. Hume.

1. A Fibula of tortoiseshell, the pin also of shell, and a complete miniature comb, supposed to have been used in the early part of the reign of George III.
2. Four elegant gold buckles of the same period.

---

* Transactions, p. 21.

The following Paper was read :—

On Micro-Geology.* *by Edward H. Birkenhead, F.G.S.*

1*st January*, 1863. ARCHÆOLOGICAL SECTION.

William Mathison, Esq., in the Chair.

Mr. Bell Williams, 57, Grove street, was duly elected an ordinary member of the Society.

The following donations were presented :—

From Mr. C. Roach Smith.

1. Mediæval houses and castles in England, by Ch. Wykeham Martin, Esq.
2. The Excavations at Wroxeter, by C. Roach Smith.
3. Collectanea Antiqua, part 1, vol. VI., by C. Roach Smith.

From Mr. Llewellyn Jewitt.

The Reliquary: a Depository for Precious Relics—Legendary, Biographical and Historical—illustrative of the Habits, Customs and Pursuits of our Forefathers, volumes I. and II.

The following objects of interest were exhibited :—

By Mr. T. Dawson.

An extensive collection of rare or notable etchings, coloured drawings, books &c., including the first sketches by B. R. Haydon for his large picture in the Church for the Blind, Liverpool; an original view of Liverpool, 1728; an original etching, by Gibson, 1812; a caricature. entitled "Last Scene in the New Play of the "Old Corporation," 1835, &c.

By Mr. Sansom.

Numerous specimens of British and foreign fossil plants and animals, shells &c., dredged from a depth of nearly two miles in the bed of the Atlantic; and some diatomaceæ from the Rappahannock.

The following Paper was read :—

On certain deep-sea and other Specimens of Natural History, as seen under the Microscope, *by Thomas Sansom, F.B.S.E.*

8*th January*, 1863. LITERARY SECTION.

John F. Marsh, Esq., in the Chair.

The following donations were presented :—

From the Royal Society of Literature.
Proceedings, vol. VII., part 2.

he Statistical Society.
n al, vol. XXV., part 4.

From the Royal Asiatic Society.
1. Journal, vol. XX., part 1.

---

* Transactions, p. 41.

2. Report, Prospectus and Publications of the Oriental Translation Committee, 1861.

The following objects of interest were exhibited:—

By the Rev. Dr. Hume.
Two spears; one from New Zealand, the head elaborately carved and ornamented with feathers and tassels of hair.

By Mr. Forrest.
A book of emblems printed at Lyons in 1551, containing numerous wood cuts.

By Mr. J. H. Gibson.
1. A bronze medal, being one of those presented by Alexander Davison, Esq., to the officers and seamen of the fleet which gained the victory of the Nile in 1798.
2. Two tiles found at Chester, bearing the inscription L E G XX—VV.

The following Paper was read:—

EVERY-DAY LIFE OF A COUNTRY GENTLEMAN OF CHESHIRE IN THE 17TH CENTURY: AS SHEWN IN THE PRIVATE EXPENDITURE JOURNAL OF COLONEL HENRY BRADSHAW, OF MARPLE AND WYBERSLEIGH,* *by A. Craig Gibson, F.S.A.*

15*th January*, 1863. SCIENTIFIC SECTION.

JOHN HARTNUP, F.R.A.S., in the Chair.

The following donations were presented:—

From the Royal Society.
Proceedings, vol. XII., Nos. 50 to 52.

From the Geologists' Association.
Proceedings, vol. I., Nos. 1 to 8.

From the Royal Irish Academy.
Transactions, vol. XXIII., part 2, and vol. XXIV. part 2.

The following objects of interest were exhibited:—

By the Rev. Dr. Hume.
Three Chinese objects, viz.:—
1. An inkstand in soapstone, representing a vessel floating on the water, with shore and trees in the background.
2. A small lamp in soapstone, of Roman form.
3. A piece of mother-o'-pearl, apparently formed for a pendant from a child's neck.

By Mr. C. S. Gregson.
1. Five species of the Sandpiper with their eggs, including two of the Sanderlin, now exhibited for the first time.
2. Objects illustrative of the life-history of the honey-bee.
3. *Scolytes destructor*, a coleopterous insect well known as a destroyer of the elm.

---

* Transactions, p. 67.

By Mr. H. S. Fisher.

Seventeen species of the wild rose found in this neighbourhood, being an addition of several to those given in Dickinson's "Flora of Liverpool," 1854.

The following Papers were read:—

List of the British Roses and Brambles occurring in the Liverpool District,* *by Mr. H. S. Fisher;* and

On the Habitats of some of our British Ferns,† *by Nicholas Waterhouse, Esq.*

5th February, 1863. ARCHÆOLOGICAL SECTION.

A. Craig Gibson, F.S.A., in the Chair.

Alexander Steele, Ph.Dr., Douglas, Isle of Man, was duly elected an ordinary member of the Society.

The following donations were presented:—

From the Society of Antiquaries of Normandy.
Memoirs, third series, vol. iv, parts 3 and 4.

From the Society of Antiquaries of Newcastle-upon-Tyne.
Archæologia Æliana, new series, No. 19.

From the Author.
Documents relating to the Winkley family, collected by William Winkley, Jun., F.S.A.

From Mr. Wilkinson.
The Lady's and Gentleman's Diary, or Poetical and Mathematical Almanack for the year 1863.

From Dr. Kendrick.

1. A hollow brick, many hundreds of which were found in the foundation of an old dye house in Norton Folgate, London, said to have been erected in 1685 by French Protestant Refugees.
2. Drawing of a Roman brand-iron or fire-dog, found during recent excavations at the Roman station, Wilderspool, near Warrington; the original in the donor's possession.
3. Tricking of the arms of Moore of Bank Hall, Liverpool, in the year 1582, done by the late Sir W. Betham, Ulster king-of-arms.
4. Seal of Henry Moore, Esq., (probably a Liverpool man), Lieut. Governor of Jamaica in 1760.

From Mr. J. H. Gibson.
A halbert-head formerly carried before the Mayor and Corporation of Clitheroe, mounted by the donor on a new staff.

The following objects of interest were exhibited:—

By Mr. H. Ecroyd Smith.

1. Fac-simile of Magna Charta, with the arms and seals of the barons emblazoned in gold and colours.

---

* Transactions, p. 93. † Transactions, p. 97.

2. A companion sheet, containing the Chartulary or Roll of Battle Abbey, surrounded by the arms of the Conqueror and the Norman barons who took part with him in the battle of Hastings.

By Mr. Thomas Dawson.

1. An old newspaper, containing "a relation of such news as was "brought to Liverpool in Lancashire from Ireland—by Captain "George Cranage—5th April, 1650."
2. Catalogues of the first three Exhibitions of the Academy of the Liverpool Royal Institution, 1822, '24 and '25.
3. The Liverpool Chronicle, Nov. 19, 1767, vol. I, No. 1.
4. Twenty-one Views of the Lakes, with descriptions by P. Holland; engraved by Rosenberg, Liverpool, August 1, 1792.
5. A printed letter "To the Worshipful the Magistrates: To the "Gentlemen of the Council: and To the whole Community of "the Town of Liverpool," on the subject of supplying the town with fresh water, dated Liverpool, Dec. 17, 1751.
6. Moss's Medical Survey of Liverpool, 1784.
7. A complete set of Liverpool Guides, by W. Moss.

By Mr. Morris C. Jones.

An ancient bronze spear-head, one of a considerable number found on a farm called "Crowther's Coppice," about three miles to the North-east of Welshpool, Montgomeryshire, and at a distance of little more than a mile from Buttington, where a great battle was fought between the Danes and Saxons in the year 894.

By Mr. J. H. Greene, Oldhall Street, through Mr. Mayer.

Various family relics, including two earthenware dishes, said to have been taken to New England in the *Mayflower;* a pair of high-heeled embroidered silk shoes, worn by Mr. Greene's great-great-great-aunt at her wedding in 1747; a glass goblet which belonged to the same lady; and a queen's-ware earthenware plate bearing a medallion of Frederic the Great and, in three compartments, in raised letters, the inscription, "success to the King "of Prussia and his forces."

By Mr. Mayer, F.S.A., V.P.

Several specimens of the celebrated leaden figures, &c., found at Shadwell, on the Thames, where articles of this description have been found in such numbers as to suggest the supposition of their being portion of the cargo of a foreign vessel wrecked on her passage up the river. Mr. Mayer expressed his suspicion that they are forgeries.

The following Paper was read:—

On the Life and Writings of the late Henry Buckley,* *by T. T. Wilkinson, F.R.A.S.*

12*th February*, 1863. LITERARY SECTION.

Col. Sir William Brown, Bart., V.P., in the Chair.

---

* Transactions p. 115.

The following donations were presented:—

From the Bureau of Agriculture, Washington, D.C.

1. Report of the Commissioner of Patents for the year 1861, Agriculture.

2. Circular from the Commissioner of Agriculture of the United States on the present Agricultural, Mineral and Manufacturing Condition and Resources of the United States, 1862.

From the Author.

Annual Report of Brevet Lieut.-Colonel J. D. Graham, Major of U.S. Topographical Engineers, on the Improvement of the Harbours of Lakes Michigan, St. Clair, Erie, Ontario and Champlain. 1858.

From Major Greig.

Report on the Police Establishment and the State of Crime, with Tabular Returns, for the year ending 29th September, 1862; by the Watch Committee of the Borough of Liverpool.

From the Author.

The Lesser Lights of Literature: a Paper read before the Philomathic Society by David Buxton, F.R.S.L., &c. &c.

The following objects of interest were exhibited:—

By Mr. Geo. M. Browne.

Two numbers of the Liverpool Chronicle, dated 1768.

The following paper was read:—

On the Applications of Electricity,* *by Edward B. Bright, F.R.A.S.*

[This Meeting was attended by numerous friends of the Members, amongst whom were many Ladies; and the Paper, which was illustrated by a succession of very effective experiments, was read in the Theatre adjoining the Society's ordinary meeting-room.]

19*th February*, 1863. SCIENTIFIC SECTION.

Nicholas Waterhouse, Esq., in the Chair.

W. A. F. Saunders, Esq., Wennington hall, late High Sheriff of Lancashire, a member *ex officio* during his Shrievalty, was duly enrolled as an ordinary member of the Society.

The following donations were presented:—

From the Royal Irish Academy.

Proceedings, Vol. VII, Nos. 1 to 8.

---

* Transactions, p. 223.

From the Geological and Polytechnic Society of the West Riding of Yorkshire.
Proceedings for 1861.

From the Leeds Philosophical and Literary Society.
Annual Report for 1861-62.

From the Liverpool Philomathic Society.
Proceedings, Vol. VII, 1861-62.

Mr. Adam Holden exhibited a black-letter copy of the translation into English of the Spanish work of Peter Martyr, detailing the voyages and discoveries of the Spaniards in the Indies, &c., dated 1555.

The following paper was read:—

On the Idea of Shakspeare's Midsummer Night's Dream, *by the Rev. Hermann Baar, Ph.Dr.*

5th March, 1863. ARCHÆOLOGICAL SECTION.

Joseph Mayer, Esq., F.S.A., V.P., in the Chair.

The following donations were presented:—

From Messrs. R. Besley and Co., London, through Mr. Brakell.
A General Specimen of Printing Types.

From the Société Archéologique de l'Orléanais.
Bulletin, No. 41.

From the Leicester Archæological Society.
Proceedings, vol. I., part 1.

From the Norfolk and Norwich Archæological Society.
Original Papers, vol. VI., parts 1 and 2.

From the Numismatic Society.
The Numismatic Chronicle, N.S., Nos. VI., VII., VIII.

The following objects of interest were exhibited:—

By Mr. T. Dawson.
1. A collection of broadsides and views referring to Liverpool, principally of the last century.
2. Copy of "A Sermon preach'd on the occasion of the death of "her late Majesty Queen Ann of glorious memory, in the "Parochial Church of St. Peter in Liverpoole, on Sunday, "Sept. 5, 1714."

By Mr. H. Ecroyd Smith.
An object, unique in respect to its date (12th or 13th century), recently found on the Cheshire sea-shore. It had evidently been used as a perfume-casket, and bears round the side an inscription which has been variously interpreted, but no conclusive explanation of it has yet been suggested. An engraving of this box was lately published in the Gentleman's Magazine.

By Mr. Newton.
"Discours du Songe de Philophile;" a folio volume printed at Paris in 1546, containing numerous wood-cut illustrations of superior execution for the period.

The following paper was read:—

On the Origin and Progress of the Gulf Stream, *by the Rev. Charles W. Denison, Boston, U. S. A.*

12*th March*, 1863. LITERARY SECTION.

William Mathison, Esq., in the Chair.

The following donations were presented:—

From the Smithsonian Institution.
1. Annual Report of the Board of Regents for the year 1860.
2. Catalogue of Publications of the Institution, corrected to June, 1862.

From the Literary and Philosophical Society of Liverpool.
Proceedings, 1861-62, No. XVI.

From the Publishers.
Poor Rabbin's Ollminick for the Town o' Bilfawst, 1863; being an illustration of local dialect.

From Mr. C. S. Gregson.
Proceedings of the Northern Entomological Society for June and December, 1862.

From Mr. J. R. Hughes.
On the manufacture of puddled or wrought steel, by William Clay.

The following objects of interest were exhibited:—

By the Rev. Dr. Hume.
A fragment of mountain limestone containing corallites, being part of a boulder found on the Egremont shore of the Mersey.

By Mr. A. Craig Gibson, F.S.A.
Thirty bronze medals referring to events in the reign of the First Napoleon; a medal of Charles IX., dated 1572; and one of Henry IV., dated 1604.

By Mr. Fabert.
1. An engraving entitled "Tentation de St. Antoine," containing numerous grotesque and monstrous figures, published at Paris, *n.d.* The designer's name is Callot.
2. Two octagonal gold coins of Australia, being a fifty dollar piece and quarter dollar respectively.

By Mr. Gregson, in illustration of his Paper.
1. Specimens of forest and fruit-bearing trees destroyed by the larvæ of insects.
2. A collection of coleopterous and other insects.

The following Papers were read :—

Notes on Insects injurious to Fruit and Forest Trees,* by *Mr. Charles S. Gregson*; and

Popular Rhymes and Proverbs connected with Localities, Second Series,† *by Alex. Craig Gibson, F.S.A.*

19*th March*, 1863. SCIENTIFIC SECTION.

Thomas Dawson, Esq., in the Chair.

The following gentlemen were duly elected ordinary members of the Society :—

Edward Dawson, Aldcliffe hall, Lancaster.
Richard Newsham, Preston.
Edward Satterthwaite, Lancaster.
Andrew Tucker Squarey, Apsley villas, Lower Bebington.

The following donations were presented :—

From the Royal Society.
Proceedings, vol. XII., No. 53.

From the Royal Geographical Society.
Proceedings, vol VII., No. 1.

From the Geological Society.
1. Quarterly Journal, vol. XIX., part 1.
2. Charter and Bye Laws.
3. List of Members, 1862,

From the Royal Dublin Society.
Journal, Nos. 26 to 28.

From the Geological Society of Dublin.
Journal, vol. IX., part 2.

From Mr. W. G. Herdman.
Diary of a Journey from Coalbrookdale to London, anno 1743 ; to which is added an estimate of the relative importance of the Thames and Severn. Anonymous.

The following objects of interest were exhibited :—

By the Rev. Dr. Hume.

1. A horn of *bos primigenius*, obtained in the opening or tunnel discovered in Liverpool last summer, running from the site of the old Castle, near St. George's Church, down towards the water.
2. A two-handled Vase, manufactured near St. Helen's three or four years ago. It was made, with some others, after a copy left by a stranger who never returned for them. It is supposed they were intended for forgeries of the antique.

---

* Transactions, p. 203. † Transactions, p. 159.

3. A bow and four arrows from the Marquesas Islands. Two of the arrow-heads are barbed and two pointed; and all are said to be poisoned.

By Mr. J. H. Gibson.

1. A Turkish yataghan, mounted in silver.
2. A horse-pistol, with silver mountings, about 100 years old.
3. An American "Eagle," or gold ten-dollar piece, dated 1800; a Half-Eagle, dated 1806; and a Quarter-Eagle, dated 1807; being of the earliest types of the gold coinage of the United States.

The following Paper was read:—

On the Typical Quadrumana,* *by Cuthbert Collingwood, M.B. &c.*

16*th April*, 1863. SCIENTIFIC SECTION.

Peter R. McQuie, Esq., in the Chair.

Mr. H. Ecroyd Smith, Aldboro' House, Egremont, Birkenhead, was duly elected an ordinary member of the Society.

The following donations were presented:—

From the Royal Society.
Proceedings, vol. XII, No. 54.

From the Society of Arts.
Journal, Nos. 471 to 542.

From the Statistical Society.
Journal, vol. XXVI, part 1.

From the Publisher.
Health; a Family Medical Journal, Nos. 5 to 9.

The following objects of interest were exhibited:—

By the Rev. Dr. Hume.

1. A glass bead, belonging to Mr. Ecroyd Smith, excavated by a rabbit on Hilbre Island. It is of a bright cobalt blue, veined with enamel of yellow, banded with a small thread of green.
2. Two specimens of earth; one dredged from a depth of 1950 fathoms in the Atlantic, the other from a warm spring in Iceland, near Geyser.

By Mr. Mathison.

1. Four small dishes of copper, covered with enamel, being part of the *loot* from the Chinese Emperor's Summer Palace.
2. A small image, of Chinese work, in jade-stone.
3. A pair of Spanish fans of the early part of last century.
4. A picture in the Greek style, by an Italian artist of the 13th century, representing the Annunciation.

---

* Transactions, p. 141.

By Mr. Forrest.

1. Specimens of a 2½-inch globe-lens for photographic purposes, invented by Harrison of New York. The glass covers a flat field of 60 degrees.
2. Two pictures taken by Harrison's new globe lens above described.

During a conversation arising out of the exhibition of the lens, Mr. Forrest undertook to read before the Society a statement of the grounds on which he claimed for Liverpool the priority, in England, in the art of photographing the moon and other celestial bodies by their own light.

The Rev. A. Hume, D.C.L. &c., Hon. Secretary, called attention to a proposal to raise, near the spot, a memorial of the execution of James, seventh Earl of Derby, at Bolton, in 1651.

The following paper was read :—

WHAT IS THE PHOTOGRAPHIC IMAGE ? *by Mr. J. H. Glover.*

The author, after stating the various theories proposed from time to time, based respectively on chemical and electrical agency, and the experiments recently made by himself in elucidation of the question, summed up the result of his enquiries in the following terms : —

The action of light is first chemical, disturbing a portion of the iodine or bromine, which is not actually separated until brought in contact with some combining substance in the developing fluid, producing an image of *subiodide of silver.* This substance possesses an electrical affinity for the particles of metallic silver, as reduced from its solution by the subsequent *intensifier.*

The question naturally arises—how do you account for the action of the old developers which contain no recognized substance capable of combining with the suspended iodine? The answer is simple enough. When a solution of pyrogalic acid and silver is applied to a sensitive plate which has been exposed to light, the action of the developer is reversed. The pyrogalic acid having no affinity for iodine, has first to reduce a portion of metallic silver from its solution. We have then all the conditions for the formation of the image. The metallic silver has a strong affinity for the iodine, subiodide is formed, reduction of the nitrate progresses, and intensification is the consequence.

Again, the proto-sulphate of iron developer is more rapid in its result than the pyrogalic acid. The reason is obvious. The salt of iron is the more energetic reducing agent, and the metalic particles consist of pure silver, which is not the case from pyrogalic acid, they being more or less associated with organic matter. In the iron development then, we have closer contact of the combining substances, consequently greater rapidity of action.

While on this subject we ought not to overlook the beauteous images produced by the now neglected, because evanescent, Daguerreotype process, the pioneer of all photography.

The foundation of the image consists of a surface of highly polished silver, having a delicate superstratum of sensitive iodide of the same metal.

The action of light is precisely the same as upon the collodion film, but in this instance we have an absorbent of the liberated iodine in the metallic substratum, so that the plate itself possesses all the elements of chemical action, and in consequence the subsequent electrical affinity for the condensed mercurial vapours which form the visible image.

7th May, 1863. ARCHÆOLOGICAL SECTION.

JOSEPH MAYER, ESQ., F.S.A., V.P., in the Chair.

Mr. Edward B. Bright, 2, Exchange buildings, was duly elected an ordinary member of the Society.

The following donations were presented :—

From the Royal Geographical Society.
Proceedings, vol. VII, No. 2.

From the Numismatic Society.
The Numismatic Chronicle, N.S., No. 9.

From the Architectural and Archæological Society of the County of Buckingham.
Records of Buckinghamshire, vol. II, No. 8.

From the Kilkenny and S. E. of Ireland Archæological Society.
Proceedings and papers, N.S., No. 38.

From the Sussex Archæological Society.
Sussex Archæological Collections, vol. XIV.

From the Manchester Literary and Philosophical Society.
Proceedings, April to June, 1860.

From C. Roach Smith, F.S.A.
1. On an unpublished coin of Carausius and two of Allectus; by Churchill Babington.
2. Florin d'or de Tecklenbourg.
3. Trois Bulles d'or des Empereurs belges de Constantinople.

From Mr. H. S. Fisher.
Naturalists' Scrap Book, part 1.

From M. de Perthes.
L'Abbevillois, French Newspaper for the 18th of April, 1863.

From the Proprietors, through Mr. T. Reay.
The *Liverpool Compass*, a Literary and Scientific Journal, Nos. 1 to 9.

From Mr. T. Dawson.
A copy of a reprint of Mr. John Eyes's Map of Liverpool, 1765, with the addition of the names of the principal contemporary land owners.

The following objects of interest were exhibited :—

By Mr. T. Dawson.
1. Liverpool editions of Everard's Book-keeping, 1764, and the History of Colonel Jaque, 1784.

2. Thirteen views in Chester and Cheshire, taken in 1810 for Lysons's "Magna Britannia."
3. A photogram of the Bazaar which stood until recently at the corner of Church-street and Whitechapel.

By Mr. H. Ecroyd Smith.
The plan of a fine hunting villa of the Roman period found some years ago in the neighbourhood of Treves, with numerous coloured drawings of its Mosaic pavements.

By Mr. J. H. Gibson.
1. An elaborately carved oval picture frame of Chinese work.
2. A group in ivory procured at Penang, believed to be the work of the Malays.

By Mr. J. S. Dalton.
A copy of the *Liverpool Chronicle* for May 12—19, 1768.

The following papers were read:—

On the Training, Ceremonial, and Maxims of Chivalry, *by the Rev. W. T. Barry, B.A.;* and On the Scarcity of Home-Grown Fruits in Great Britain, with remedial Suggestions,* *by C. Roach Smith, F.S.A., &c.*

14*th May*, 1863. MISCELLANEOUS MEETING.

Joseph Mayer, Esq., F.S.A., V.P., in the Chair.

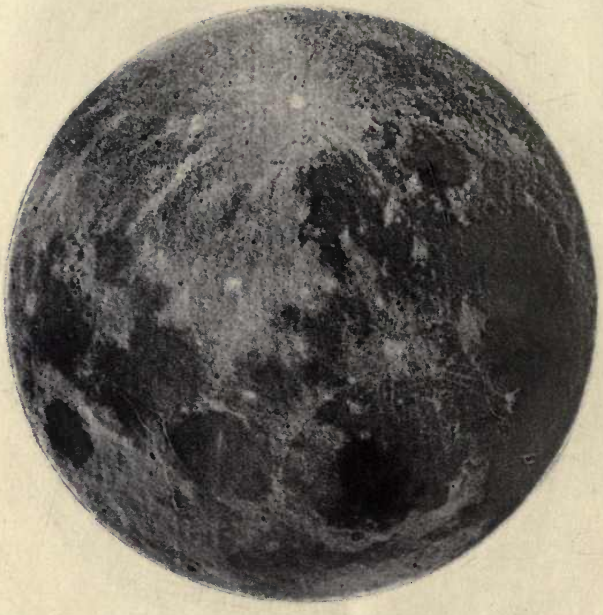
This meeting was held by invitation of the Chairman, at his Museum of British and Foreign Antiquities, 8, Colquitt street, and was numerously attended by ladies and other friends as well as members. After having inspected the contents of the various rooms, the company assembled in the principal apartment, when Mr. Mayer, after cordially welcoming his guests, announced his intention to offer his collection to the town of Liverpool on a suitable building being provided for it.

Mr. J. A. Forest then read—

An Account of the earliest successful Experiments made in England in producing, by their own light, Photograms of the Moon and other heavenly bodies.

In the first number of the *Liverpool Photographic Journal*, published on the 1st January, 1854, is announced the fact that the British Association had offered a premium for the best photograph of the moon, for which it was expected our resident photographers would compete. On the 12th of January I waited upon Mr. John Hartnup, at the Liverpool Observatory, and asked him if he would co-operate with the Liverpool Photographic Society in endeavouring to obtain photographs of the moon for the coming meeting of the British Association, which was proposed to be held in Liverpool in September of that year. He acqui-

* Transactions, p. 129.



THE MOON.

From a Photograph taken at the Liverpool Observatory in Sept.r 1854 by Mess.rs John Hartnup and J.A. Forrest.

PHOTOLECTRIC ENGRAVING (DALLAS' PROCESS)

Duncan C. Dallas, 108, Fleet St. London, E.C.

esced most cordially in the proposal, and we commenced our arrangements immediately afterwards. At this early stage of our proceedings we were assisted by the counsel of Mr. G. R. Berry, and in February we were joined in our operations by Dr. Edwards.

Before proceeding further with the narrative, I will describe the position of lunar photography in the beginning of 1854. The discoveries of M. Daguerre and Mr. Fox Talbot were both brought out in England under the bane of the patent laws: the result was that our American cousins, free from such trammels, made rapid progress in the development of the Daguerreotype silver-plate process. We find that Professor Bond, of Cambridge, U.S., was the first person that applied this process to the delineation of the moon. He possessed instruments of larger magnifying power than those at the Liverpool Observatory. His perseverance was highly creditable to him as a scientific investigator, for he spoiled one or two hundred Daguerreotype plates before he obtained a good result. Some of these specimens reached England, and stimulated the British Association to make the offer above named in the session of 1853. In the meantime a new discoverer had appeared in Mr. Scott Archer, of London, imparting his valuable collodion process to the world, with a disinterestedness which cannot be too highly praised, no restrictions having been imposed after the discovery. Had he done otherwise, his fortune was secure; for at this moment all other photographic media have nearly ceased to exist, and his alone remains.

The telescope of the Liverpool Observatory is furnished with an excellent equatoreal mounting and clock-work motion of great firmness and steadiness. The object-glass has a focal length of about 12½ feet; and a small camera-box being substituted for the eye-piece, the image is received upon the ground glass or the prepared plate in the ordinary manner. After much fruitless labour the chemical focus was discovered to be about eight-tenths of an inch beyond that of the visual one, the glass being over-corrected to that extent in respect to its actinic focus. It was at first difficult to decide whether the want of sharpness of outline observed was due to the motion of the object or to imperfect focussing, and the most excellent specimens were obtained by the continual guidance of Mr. Hartnup's steady hand in addition to the clock-work movement, while his eye was kept on the finder with a micrometer eye-piece of good power, crossed with fine wires, by which he could maintain the position of a given point in the field. The time for taking these pictures varied from thirty seconds to three minutes, and the chemicals employed were those ordinarily used for taking positive collodion pictures. The bath was slightly acid, and the developing agent was sulphate of iron, in the proportion of ten grains to the ounce of water. The pictures were afterwards converted into negatives by aid of chloride of gold. The impressed image measured one inch and one-third in diameter. This was too small to be useful, and the consequence was, that Mr. Hartnup and I called upon an optician to inquire how far we might safely enlarge it without loosing sharpness. He said he thought two or three diameters. A few days afterwards Mr. Hartnup proposed to send to Mr. Towson for his magic lantern, and our first attempt was to enlarge it on the screen to twenty-five feet diameter. You may easily imagine our astonishment to find it nearly as sharp as the original, and our optical friend's theory utterly groundless. We beheld the crater of Copernicus, which is almost invisible in the original, six inches in diameter, with its shadow

beautifully delineated; and, like Cuvier when he placed the bones of the mammoth together for the first time, we looked with delight on seeing the surface of the moon as no one had seen it before. With data like this to go by, we proposed to get a screen made fifty-six feet square, to cover the side of St. George's Hall, and to project the image across the hall by the means of an oxyhydrogen light. We were very kindly assisted in this by Mr. Wood, of the firm of Messrs Abraham and Co., Lord street.

It was found necessary to enlarge the first impression suitable for the magic lantern. This part of the arrangement was intrusted to Mr. John M'Innes, who adopted the mode of enlargement proposed by Mr. Stewart in a letter to Sir John Herschel, which appeared in the *Athenæum* early in 1854—with only this difference, that instead of having the box made in one piece he used his small camera, introducing the lens into the opening of a half-plate camera box, thus placing them front to front. The negative to be copied he placed in the groove of the slide of the small camera, and exposed it to the direct rays of the sun, or to the brightest portion of the sky, the picture being received upon a collodionised glass plate placed in the slide of the larger box.

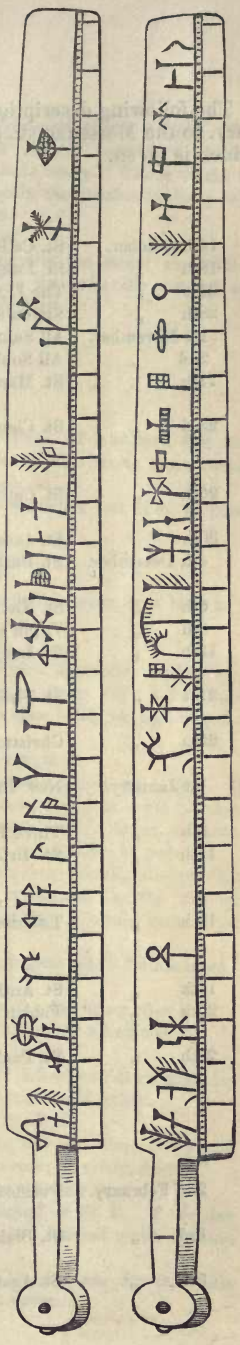
In the course of our experiments a question arose as to the practicability of taking a stereoscopic view of the moon. Mr. Hartnup suggested a plan by which this would be settled: it was by taking the moon twelve hours before her full and then twelve hours after, and the result was that we got a shadow of both sides. We put these impressions into the stereoscope, on looking through which the moon appeared a perfect ball.

This paper was followed by a description given by the Rev. A. Hume, D.C.L., Hon. Secretary, of the Ancient Messedag Stave or Prim Stave, derived chiefly from a treatise of the learned Professor Munch of Copenhagen.

After describing the old Scandinavian system of measuring and dividing the year, the rev. gentleman proceeded to say that, although the calendar was altered, on the introduction of Christianity, everything which could in any way be retained was transferred from the old to the new. Instead of Pagan festivals came those of the Christians, which out of church were celebrated as before by merry-making, and several, as, for instance, Christmas (yule) did not even change names. The Summers-feast became St. John's day, and the harvest-feast was either transferred to Michaelmas day, fourteen days before, or to All Saints' day, fourteen days after. Instead of the old pagan Gods, to whom special days had been dedicated, came the Catholic Christian saints, and the confidence reposed in the former as patrons was transferred to the latter. Inasmuch now as particular Gods were supposed to exercise influence over the weather, the yield of the crops, &c.; and the days dedicated to them denoted when particular work, as ploughing, shearing, &c., ought to be done, or were supposed to indicate the coming state of weather and the prosperity of the year (the so called Mark-days)—it became necessary to have saints to supply their place. As may be supposed, it was the office of the clergy to keep account of the time, and calculate when the various holydays would occur. For the laity this was much more difficult than formerly, as so many Christian festivals do not fall on any fixed day, but are governed by Easter, and thus occur now sooner and now later. The fixed holydays could be more

easily remembered by the common man, as, without knowing how to write, he might make a list of the days of the year in the shape of points or strokes, and denote the holydays by certain marks. It was of importance to know the proper "mark-days," not so much in a religious point of view, as to be able to make the necessary prophecies regarding the weather. There can be no doubt that such self-made calendars existed in Pagan times, and the same system prevailed after the introduction of Christianity up to the last century, by arranging the so-called Messe or Prim Staves.

There are two descriptions of Staves, Messedag-Staves (Messedag i.e. day of mass) and Prim-Staves. The former, which are the most simple, only contain the days and signs for those to be particularly observed; the Prim-Staves, besides, contain the marks for the Sundays and the changes in the moon, whence their name, as the first full-moon after equinox, (in Latin *prima luna*) was thus ascertained. The Messedag-Staves are met with most frequently. They consist mostly of flat pieces of wood, about an ell long, two inches broad and half an inch thick, and have frequently a handle, giving them the appearance of a sword. Sometimes they have served as measure of an ell. The flat side is divided into two unequal parts by a line running lengthways. In the narrower space the days are marked at equal distances, half a year on each side, or 182 marks on the one side and 183 on the other side. In the wider space, and connected with the days, stand the signs for those to be particularly observed. On the edges the weeks are indicated. The marks for the days do not run from January to July and from July to December, but, on the side called Vetr-Leid, i.e., winterside — from the 14th October till the 13th April; and on the other, called Somar Leid, i.e., summerside — from the 14th April till the 13th October. The signs are partly taken from the meaning they have with regard to the weather, husbandry, or from some legend of the Saint for the day. Hardly two staves alike can be found; they are more or less elaborately carved, and the days marked often vary. Nor are the Staves all of the form described: some are made of a round or oblong shape, and the name "Stave" can, therefore, hardly be applied to them. A semi-circular mark sometimes placed immediately before a Saint-day, denotes the eve of such a day.



1 2

Fig. 1, Winter Side. Fig. 2, Summer Side. (One-fourth size.)

The following description will be seen to apply, with tolerable accuracy, to the Messedag stick belonging to the Society, an illustration of which is given.

WINTERSIDE.

14th October.	St. Calistus—Sign generally a fir tree.
18th „	St. Luke—Sign a cross.
21st „	The 11,000 Virgins—A ring or some female figures.
28th „	Simon and Judas—A treble cross or a sledge.
1st November.	All Saints'—A ships mast, "the navigation then ceasing."
2nd „	All Souls'—A cross.
11th „	St. Martin's Day—The neck of a goose, which was then eaten. (This custom is still observed.)
23rd „	St. Clement's Day—An anchor, the Saint being tied to one and drowned. All vessels should be in port on this day.
25th „	St. Catherine—A cross—sometimes a wheel to indicate the way she died.
30th „	St. Andrew—A fishing-hook or St. Andrew's cross. X
4th December.	St. Barbara—Generally a tower or a chain to indicate her imprisonment.
6th „	St. Nicholas—Sometimes a candle with three branches.
8th „	Virgin's Conception—Generally a cross.
13th „	St. Lucy—Sometimes a pike "many fish being then caught." Sometimes a stake, St. L. being burnt.
21st „	St. Thomas—Sometimes a barrel as the Christmas ale was then brewed.
25th „	Christmas—A drinking-horn, seven branched candlestick or a sun.
1st January.	New Year—A small sun, a treble cross or an hour-glass. If the sky was red, war would follow.
6th „	Three Kings—Generally three crowns, sometimes a can.
11th „	St. Brictiva (a saint not known)—Generally a horse, as a peasant, who neglected the day and drove out, broke one of his horse's legs.
13th „	Twentieth day after Christmas—Generally a reversed horn or a barrel, the Christmas ale being then finished.
17th „	St. Anthony—Generally a cross.
20th „	Fabian and Sebastian—A double cross or an axe, as firewood should be cut about this time.
25th „	St. Paul's Conversion—A cross, sometimes a bow or a sun. If the sun shone, even so long only as it took to mount a horse, the year would be a good one:—Storm would bring war; Fog, sickness; Snow and Rain, famine.
2nd February.	Purification of Virgin—Some candles or a seven branched candlestick.
3rd „	St. Blaise—Generally a vessel or a horn. If it blew on that day it would blow all the year.
5th „	St. Agatha—Generally a mouse.

22nd February.	St. Peter's Stool—Generally a key—sometimes a stone. The mariners should commence getting their vessels ready. There would be no change in the weather for forty days following.
24th „	St. Matthias—Sometimes a cross.
12th March	St. Gregory—Sometimes the figure of the saint; also a bird.
25th „	Annunciation of Mary—The sign was generally a figure representing Mary.

SUMMERSIDE.

14th April.	Tiburtius and Valerianus—A fir tree. If it snowed that day it would snow nine times more before Midsummer.
16th „	St. Magnus—A pickaxe, as the fieldwork was then to commence.
23rd „	St. George—Sometimes a cross.
25th „	St. Mark—No definition of sign.
1st May.	Philip and James—Sometimes a double cross, or a bird in a tree.
3rd „	Invention of the Cross—A cross.
15th „	St. Hallvard—A millstone, sometimes a number of dots signifying corn, three days before and three days after being the best time for sowing.
17th June.	St. Botolf—Generally a cross or a scythe.
24th „	St. John the Baptist—Sign sometimes a head on a dish. If it rained there would be a wet harvest.
29th „	St. Peter and St. Paul—A key—sometimes a flower, as medicinal herbs should then be gathered.
2nd July.	Visitation of the Virgin—St. Swithin—Generally two branches of a tree crossways. As the weather was on that day it would remain till 29th July.
8th „	St. Sunniva—A great holyday, sign generally a double cross.
14th „	Midsummer—A rake or a stave.
20th „	St. Margaret—Generally a bucket the day being often wet.
22nd „	St. Mary Magdalen—Sometimes a stool or a half-moon.
25th „	St. John the Apostle—A sword.
29th „	St. Olaf—The axe of St. Olaf. If full moon fell on that day a severe winter would follow.
3rd August.	Discovery of St. Olaf's Body—A small axe
10th „	St. Lawrence—A gridiron. If the day was clear, the winter would be severe; if misty, damp.
15th „	Assumption of Mary—A crown, or a female figure.
24th „	St. Bartholomew—Generally a figure of St. B. If the day was clear good harvest weather would follow.
1st September.	St. Giles—A millstone, because if the day was dry the mills would want water.

8th	September.	Nativity of the Virgin—A tree—sometimes a crown or a pair of shears, as the sheep should then be shorn.
14th	„	Exaltation of the Cross—A cross.
21st	„	St. Matthew—Sometimes a balance denoting equinox.
29th	„	St. Michael the Archangel—Sometimes the face of St. M. If it froze before that day it would freeze after the 1st May.
4th	October.	St. Francis—Sometimes a cross.
7th	„	St. Birgita—Sometimes a cross with a ring at the top.

ANNUAL EXCURSION.

The Annual Excursion was made on Saturday the 27th of June, 1863; when the members, accompanied by numerous friends of both sexes, visited the Parish Church of Sefton, which was inspected under the guidance of Mr. Picton, the Rev. Dr. Hume and other gentlemen acquainted with the remarkable features of the building. On quiting the church the party proceeded to Ince Blundell Hall, which was kindly thrown open on the occasion by the proprietor, Thomas Weld Blundell, Esq.

A considerable time was spent in the examination of the fine collection of works of art in sculpture and painting for which the hall is renowned, and the beautiful pleasure-grounds were also visited; after which the company drove to Waterloo, where they dined together, Joseph Mayer, Esq., F.S.A., &c., Vice-President, occupying the chair, A. Craig Gibson, Esq., F.S.A., Hon. Curator, and D. Buxton, Esq., F.R.S.L., Hon. Librarian, acting as vice-chairmen. The usual loyal and complimentary toasts were proposed and responded to, that of "Continued Prosperity to the Historic Society of Lancashire and "Cheshire," being given by the Venerable Archdeacon Jones, and acknowledged by the Rev. A. Hume, D.C.L., &c., Hon. Secretary. Dr Ihne, Dr. Heywood Thompson, J. A. Picton, Esq., F.S.A., George Artingstall, Esq., and other gentlemen also delivered addresses, at the close of which the party returned to Liverpool highly pleased with the day's proceedings.

INDEX.

A

Abraxes ulmata, 214.
Account of the Life and Writings of the late Henry Buckley, 115.
Adiantum Capillus Veneris, 103.
Aigburth, ferns of, 100.
Allosorus Crispus, 103.
American apes, 145, 146.
Amsterdam, foundation of, 55.
"Ancient Meols," cited, 234.
Anderson, J., enrolled a member, 242.
Animals, fossil, 43.
Annan, the, described, 160.
Apes, classes of, 143; varieties of, 144; distinguishing peculiarities of, 145; fossil remains of, 146.
Apple, the, in Shetland, 130; in Ireland, *ib.*; prices of, *ib.*; value of, 131; now a forbidden fruit, with us, *ib.*; "wassailing" the, *ib.*; neglect in the cultivation of, *ib.*; modes of restoring the cultivation of, 133; importations from abroad, 134; mode of keeping, *ib.*
Apple tree, the, its insect enemies, 217.
Applications of Electricity, 223.
Apricot trees, their insect enemies, 219.
Araucaria, 42.
Ash, the, its insect enemies, 210.
Ashfield, C. J., enrolled a member, 242.
Aspleniums, the, habitats of, 100.
Athyrium Filix Fœmina, 104.
Atlantic cable, the, 226.
Australia, coral reefs of, 52.
Authors of Papers:—
Baar, Rev. Dr., 21, 244, 250.
Barry, Rev. W. T., 256.
Birkenhead, E. H., 41, 245.
Bright, E. B., 223, 249.
Buxton, D., 240.
Collingwood, C., 141, 253.
Denison, Rev. C. W., 251.
Fisher, H. S , 93, 247.
Forrest, J. A., 256.
Gibson, A. C., 67, 159, 246, 252.
Glover, J. H., 254.
Gregson, C. S., 203, 252.
Hume, Rev. Dr., 233, 239, 243, 258.
Marsh, J. F., 1, 243.
Sansom, T., 245.
Smith, C. R., 129, 256.
Sutton, T., 241.
Waterhouse, N., 97, 247.
Wilkinson, T. T., 115, 248.

B

Baar, Rev. Dr., author of papers, 21, 244, 250.
Barbadoes, tertiary marls of, 56.
Barry, Rev. W. T., enrolled a member, 242; author of paper, 256.
Bath, oolite slabs of, 57.
Besley, R. and Co., donors, 250.
Birch, the, its insect enemies, 211.
Birds, their value on an estate, 221.
Birkenhead, E. H., author of paper, 41, 245.
Blechnum Boreale, 104.
Border buryings, 176.
Brachiopoda, the, 46.
Bradshaw, Col. Henry, private expenditure journal of, 67; family of, 68; their original rank in Cheshire, *ib.*; Col. Bradshaw's marriage, *ib.*; his children, *ib.*; correspondence 69; his second wife, 70; participates in political affairs, *ib.*; curious military account, 71; serves in the parliamentary army, 72; his civil services, *ib.*; curious letter from, 73; is brought to trial, 74; his defence, *ib.*; his death, 75; singular elegy thereon, 76; his expenditure and income, 77; his private character and habits, 78; prices of labour, provisions &c., *ib.*; journal, 83; autograph, 92.
Brambles of Liverpool, 95.
Brand s "Popular Antiquities," cited, 131.
Bright, E. B., enrolled a member, 255, author of paper, 223, 249.
Bristol, shell debris near, 57.
Brown, Col. Sir W., chairman, 248.
Browne, G. M., exhibiter, 249.
Brownie of Bodsbeck, the, 169.
Buckley, Henry, life and writings of, 115; his early youth, 116; his self-training, *ib.*; his geometrical works, 118; his success in life, 127; his death, 128.
Burke, W., exhibiter, 239, 241.
Burns's Election Ballads, quoted, 171.
Buxton, D., author of paper, 240; donor, 249.

C

Calcaire grossier of Paris, 56.
Cannel, substance of, 65.
Carboniferous limestone formation, the, 57.
Carlyle, Thomas, 176.
Carpenter, quoted, 45.
Cestracion, 45.
Cetarach Officiniarum, 104.
Chairmen at Ordinary Meetings:—
Brown, Sir W., 248.
Dawson, T., 238, 241, 252.
Gibson, A. C., 235, 237, 247.
Hartnup, J., 246.
Hughes, J. R. 243.
Hume, Rev. Dr., 240.
McQuie, P. R., 253.
Marsh, J. F., 241, 245.
Mathison, W., 245, 251.
Mayer, J., 250, 255, 256.
Towson, J. T., 240.
Waterhouse, N., 249.
Chalk formation, the, 57.
Chambers, Mr. R., cited, 160.
Charles II, death of, described, 231.
Cherry, the, remarks on, 138.
Cherry trees, insect enemies of, 220.
Chimpanzee, the, 141, 142
Christ's Hospital, diet of the boys, 129.
Chrysoclista Linnœella, 214.
Churches, beams of, eaten by insects, 221.
Cobbett, W., characteristic anecdote of, 140.
"Collectanea Antiqua" cited, 135.
Collingwood, C., author of paper, 141, 253.
Corrie, vale of, 161.
Cossus Ligniperda, an oak destroyer, 207.
Cranborne, Viscount, enrolled a member, 241.

Cryptogams, 42.
Culloden, battle of, 194.
Currant, the, 139.
Cust, Hon. Sir E , author of papers, 179, 231.
Cystopteris Fragilis, 105.

D

Dalton, J. S., exhibitor, 256.
Damson, the, 139.
Dawson, E., enrolled a member, 252.
Dawson, T., chairman, 238 244, 252; donor, 239, 255; exhibitor, 245, 248, 250, 255.
Dayman, Capt , quoted, 50.
"Deil's beef-tub," 160.
Denison, Rev. C. W., author of paper, 251.
De Perthes, J. B., donor, 255.
Derby, Earl of, tried by a court-martial, 72; statements regarding his defence, 75.
Des Cloiseaux, M., experiments of, 60.
Desmidiaceæ, 48.
Diatomaceæ, the, 50, 53.
Dickson, Sergeant, story of, 181.
Donations. See Library.
Donors (General.)
London.
Geological Society, 241, 252.
Geologists' Association, 246.
Numismatic Society, 250, 255.
Royal Asiatic Society, 245, 246.
Royal Geographical Society, 244, 252, 255.
Royal Society, 240, 246, 252, 253.
Royal Society of Literature, 245.
Society of Antiquaries, 238.
Society of Arts, 253.
Statistical Society, 243, 245, 253.
Provinces.
Buckinghamshire Architectural &c. Society, 255.
Essex Archæological Society, 242.
Leeds Literary and Philosophical Society, 250.
Leicester Archæological Society, 250.
Manchester Literary and Philosophical Society, 240, 255.
Newcastle-upon-Tyne, Society of Antiquaries of, 247.
Norfolk and Norwich Archæological Society, 239, 250.
Sussex Archæological Society, 255.
West Riding of Yorkshire, Geological and Polytechnic Society of, 250.
Liverpool.
Chemists' Association, 244.
Literary and Philosophical Society, 251.
Naturalists' Field Club, 240.
Philomathic Society, 250.
Royal Institution, 240.
Scotland.
Royal Society of Edinburgh, 244.
Ireland.
Geological Society of Dublin, 252.
Kilkenny and S.E. of Ireland Archæological Society, 242, 255.
Royal Dublin Society, 252.
Royal Irish Academy, 246, 249.
Foreign.
Bureau of Agriculture, Washington, D.C , 249.
Royal Society of Northern Antiquaries, 239.
Smithsonian Institution, 251.
Société Archéologique de l' Orléanis, 242, 250.
Société des Antiquaires de Normandie, 247.
Société Impériale d' Emulation d' Abbeville, 243.
Donors. (Individual.)
Besley, R. and Co., 250.
Buxton, D., 249.
Dawson, T., 239, 255.
De Perthes, J., 255.
Fisher, H. S., 255.
Gibson, J. H., 247.
Graham, Col J. D., 249.
Gregson, C. S., 251.
Greig, Major, 249.
Herdman, W. G , 252.
Hughes, J. R., 251.
Jewitt, Ll., 245.
Kendrick, Dr , 247.
Peacock, J., 239.
Rafn, C. C., 239.
Sinnett, F., 240.
Smith, C. R., 245, 255.
Wilkinson, T. T., 247.
Winkley, W., 247.
"Drift," the, character of, 65.
Dryden, 5.
Dryfe, the, prophecy respecting fulfilled, 162.
Dryfe Sands, battle of, 169, ballad on the, 177, Note.
Dryfesdale, Kirk of, twice washed away, 162.

E

Ecclefechan, proverb relating to, 176.
Echmoderms, shell of, 47.
Edisbury, John, Esq., letter from, 232.
Electricity, its general application, 223; number of persons employed through its use, *ib.*; its use as a motive power, 225; in minute mechanical operations, *ib.*; in submarine telegraphy, *ib*; faults in cables, how ascertained, 226.
Elm, the, its insect enemies, 213.
Elshieshields, the laird of, rhymed satire on, 171.
English labourers, their habits, 132.
Equisetum, 42.
Every-day Life of a Country Gentleman of Cheshire in the 17th Century, 67.
Exhibitors:—
Browne, G. M., 249.
Burke, W., 239, 241.
Dalton, J. S., 256.
Dawson, T., 245, 248, 250, 255.
Fabert, J. O. W., 244, 251.
Fisher, H. S., 247.
Forrest, J. A., 241, 246, 254.
Gibson, A. C., 251.
——— J. H., 243, 246, 253, 256.
Greene, J. H., 248.
Gregson, C. S., 246, 251.
Hall, J. J , 242.
Holden, A., 250.
Hughes, J. R., 244.
Hume, Rev. Dr., 239, 244, 246, 251, 252, 253.
Jacob, J. G , 244.
Jeffery, F. J., 243.
Jones, M. C., 248.
Macintyre, Dr., 243.
Mathison, W , 243, 253.
Mayer, J., 242, 248.
Newton, J., 239, 241, 251.
Peacock, J., 243.
Sansom, T., 245.
Smith, H. E., 247, 250, 256.
Towson, J. T., 241.

F

Fabert, J. O. W., exhibitor, 244, 251.
Falkirk, battle of, 192.
Ferns, British, 97; their chosen abode, 98; origin of various species, 112.

Fisher, H. S., author of paper, 93, 247; donor, 255; exhibitor, 247.
Flint in chalk, origin of, 65.
Foraminifera, the, 49, 50; effect of their labour, 51.
Forrest, J. A., author of paper, 256; exhibitor, 241, 246, 254.
Fossil Microzoa, 62.
French soldiers, their better regulated habits, 132.
Fruits, home-grown, scarcity of, 129, 139.
Fungi, 209.

G

Geometricians of Lancashire and Yorkshire, the, 115.
Gibson. A. C., author of papers, 67, 159, 246, 252; chairman, 235, 237, 247; exhibitor, 251.
Gibson, J. H., donor, 247; exhibitor, 243, 246, 253, 256.
Glover, J. H., author of paper, 254.
Goodier, T., enrolled a member, 241.
Gooseberry, the, 139.
Graham, Col., donor, 249.
Gray, the poet, quoted, 186.
Great Britain, scarcity of home-grown fruits in, 129.
Greene, J. H., exhibitor, 248.
Green, J. H., enrolled a member, 241.
Gregson, C. S., author of paper, 203, 252; donor, 251; exhibitor, 246, 251.
Greig, Major, donor, 249.

H

Habitats of some of our British Ferns, 97.
Hallidays, the, of Annandale, 169.
Hall, J. J., exhibitor, 242.
Hartnup, J., chairman, 246.
Hawkins, Susanna, 174, 176.
Heathcote, Alderman, a partisan of the Pretender, 188.
Herdman, W. G., donor, 252.
Hesiod, quoted, 16.
Heyne, quoted, 5.
Hilbre Cross, The, 233.
Hilbre, a monk of, story relating to, 233.
Hoare, C., on the vine, cited, 136.
Hobhouse's "Albania," cited, 18.
Hoddam parish, notice of, 175.
Holden, A., exhibitor, 250.
Holly, the, its insect enemies, 216.
Horace, quoted, 14.
Hughes, J. R., chairman, 243; donor, 251; exhibitor, 244.
Hume, Rev. Dr., author of papers, 233, 239, 243, 258; chairman, 240; exhibitor, 239, 244, 246, 251, 252, 253.
Hutton, Mr., letter from, 183.
Hybernia defoliaria, 214.
Hymenophyllums, the, 105.

I

Igneous rocks, 65.
Infusoria, 48.
Invertebrata, the, 46.

J

Jacob, J. G., exhibitor, 244.
Jeffery, F. J., exhibitor, 243.
Jewitt, LL., donor, 245.
Johnstones and Maxwells, great fight between the, 164.
Johnstones of Annandale, the, account of, 166.
Jones, M. C., exhibitor, 248.
Jones, Mr. T. Rupert, quoted, 64.

K

Kahau, the, 142.
Kendrick, Dr., donor, 247.
King, Lieut.-Col. V.A., enrolled a member, 241.

L

Labyrinthodon, of Warwickshire, 45.
Lancashire, devoted to the Stuart cause, 182.
Lastreas, the, 108.
Levant, mud of the, 56.
Library, additions to:—

1. *Books.*

Agriculture of the United States. Report of the Commissioner of Patents, Washington, for the year 1861, 249.
Collectanea Antiqua, 245.
Norwich, views of the gates of, 239.
Printing types, general specimen of, 250.
Reliquary, The, 245.

2. *Transactions and Proceedings of Learned Societies, &c.*

London.
Geological Society, 241, 252.
Geologists' Association, 246.
Numismatic Society, 250, 255.
Royal Asiatic Society, 245, 246.
Royal Geographical Society, 244, 252, 255.
Royal Society, 240, 246, 252, 253.
Royal Society of Literature, 245.
Society of Antiquaries, 238.
Society of Arts, 253.
Statistical Society, 243, 245, 253.
Provincial.
Buckinghamshire Architectural &c. Society, 255.
Essex Archæological Society, 242.
Leeds Literary and Philosophical Society, 250.
Leicester Archæological Society, 250.
Manchester Literary and Philosophical Society, 240, 255.
Newcastle-upon-Tyne, Society of Antiquaries of, 247.
Norfolk and Norwich Archæological Society, 239, 250.
Sussex Archæological Society, 255.
West Riding of Yorkshire, Geological and Polytechnic Society of, 250.
Liverpool.
Chemists' Association, 244.
Literary and Philosophical Society, 251.
Naturalists' Field Club, 240.
Philomathic Society, 250.
Royal Institution, 240.
Scottish.
Royal Society of Edinburgh, 244.
Irish.
Geological Society of Dublin, 252.
Kilkenny and S. E. of Ireland Archæological Society, 242, 255.
Royal Dublin Society, 252.
Royal Irish Academy, 246, 249.
Foreign.
Royal Society of Northern Antiquaries, 239.
Smithsonian Institution, 251.
Société Archéologique de l'Orléanais, 242, 250.
Société des Antiquaires de Normandie, 247.
Société Impériale d'Emulation d'Abbeville, 243.

3. *Complete Pamphlets.*

Agricultural, Mineral and Manufacturing Resources of the United States, 1862, 249.
Babington, C. C., Unpublished Coins of Carausius and Allectus, 255.
Buxton, D., Lesser Lights of Literature, 249.
Clay, W., On the Manufacture of puddled or wrought Steel, 251.
Florin d'or de Teckleubourg, 255.
Graham, Col., Report on Improvement of Harbours in North American Lakes, 249.
Greig, Major, Report on the Liverpool Police Establishment, &c., 249.
Lady's and Gentleman's Diary, 247.
Martin, C. W., Mediæval houses and castles in England, 245.
Northern Entomological Society, Proceedings of, 251.
Poor Rabbin's Ollminick, 251.
Rafn, C. C., Inscriptions runiques du Slesvig méridional, 239.
Sinnett, F., Account of S. Australia, &c., 240.
Smith, C. R., Excavations at Wroxeter, 245.
Trois bulles d'or des Empereurs belges de Constantinople, 255.
Winkley, W., Documents connected with the Winkley family, 247.

4. *Maps, Prints, Broadsides, &c.*

Coins recently found at Chester, drawings of, 239; account of, *ib.*
Diary of a Journey to London, anno 1743, &c., 252.
Eyes's Map of Liverpool, 1765, Reprint of, 255.
Health; a Family Medical Journal, 253.
L'Abbevillois, 255.
Liverpool Compass. The, 255.
Manchester, map of, in 800, 239.
Moore of Bankhall, trick of the arms of, 247.
——— Henry, seal of, *ib.*
Roman brand-iron, drawing of, 247.
Saxon London, about 1000, A.D., map of, 239.
Life and Writings of Schiller, 21.
Lime, the, its insect enemies, 214.
Linnæus, quoted, 141, *n*
List of the British Roses and Brambles occurring in the Liverpool District, 93.
Liverpool, roses of, 93; brambles of, 95; ferns of, 99.
Local Chit-Chat of the "Forty-Five," 179.
Lochmaben, description of, 171; "gousting-bane "o'," 172, castle of, 173.
Lockerbie lick, a, 165; christians, 167; domestic condition of in 1704, *ib.*; sanitary condition of, 168; proverbs concerning, *ib.*; present altered state of, *ib.*

M

Macaulay, Lord, quoted, 231.
Macdonald, Flora, 194.
Macintyre, Dr., exhibitor, 243.
McQuie, P. R., chairman, 253.
Malacoderma, their peculiar danger to churches, 221.
"Manchester Regiment, the," of 1745, how recruited, 181.
Marsh, J. F., author of paper, 1, 243; chairman 241, 245; exhibitor, 242.
Martyn, Dr., his edition of the Georgics, quoted, 4 5, 6, 7.
Massey, Squire, curious story of, 199, *n*.
Mastodonsaurus of Wirtemberg, 45.
Mathison, W., chairman, 245, 251; exhibitor, 243, 253.
Maxwell, Lord, death of, 165.
Maxwells and Johnstones, great fight between the, 164.
"Maxwell's thorn," 166.
Mayer, J., chairman, 250, 255, 256; exhibitor, 242, 248.
Medicean Codex, the, 10.
Members Enrolled:—
Anderson, J., 242.
Ashfield, C. J., 242.
Barry, Rev. W. T., 242.
Bright, E. B., 255.
Cranborne, Viscount, 241.
Dawson, E., 252.
Goodier, T., 241.
Green, J. H., 241.
King, Lieut.-Col., 241.
Newsham, R., 252.
Satterthwaite, E., 252.
Saunders, W. A. F., 249.
Smith, H. Ecroyd, 253.
Somerville, T., LL.D., 244.
Squarey, A. T., 252.
Steele, Alex., Ph. Dr., 247.
Stone, G., 238.
Whatham, W., 238.
Williams, Bell, 245.
Micro-Geology, 41.
Microscope, the, its value in science, 41.
Mineral Veins, structure of, 65.
"Moffat measure," 170.
Monkeys, 142.
Murray, Lord George, his dexterous manœuvre, 186.
Museum, Additions to:—
Halbert Head, a, 247.
Hollow brick, ancient, *ib.*
Mysian plough, the, 18.

N

Newsham, R., enrolled a member, 252.
Newton, J., exhibitor, 239, 241, 251.
Notes on Insects injurious to Fruit and Forest Trees, 203.
Nummulites, 56.

O

Oak Cynips, 209.
Oak, the, its insect enemies, 207.
Orang, the, 142.
Original Letter, giving a Contemporary Relation of the Death of Charles II., 231.
Origin of Species, 111.
Orthosia Miniosa, 208.
Osmunda Regalis, the, 108.
Owes, Professor, cited, 46, 48, 144.

P

Pampas of South America, surface of, 60.
Peacock, J., donor, 239; exhibitor, 243.
Pear Tree, the, proverb respecting, 135; notice of, *ib.*; its insect enemies, 218.
Permian formation, the, 65.
Pinus, 42.
Plants, microscopic structure of, 42.
Pliny, quoted, 3, *n.*; cited, 6.
Plough, Spanish, 1.
Plum, the, remarks on, 138.
Plum tree, the, its insect enemies, 218.
"Polirschiefer," composition of, 55.
Polycystina, the, 49, 53.
Polypodiums, the, 109.
Polystichums, the, 110.

Popular Rhymes and Proverbs connected with Localities, *Second Series*, 159, 252.
Prays Curtisella, 210.
Pretender, the, proclamation by, 183; crosses the Mersey, 185; at Derby, 187; his cause not desperate, 188; his retreat, *ib.*; remarks on, 191; his wanderings, 194; his subsequent career, 200.
Proverbs, local, 159.
Pygeæra Bucephala, 207.

Q

Quadrumana, the typical, 141; classification of, 142.
Quekett, Professor, cited, 44.

R

Rafn, C. C., donor, 239.
Repentance, tower of, 175.
Rhizodus, genus, 44.
Rhymes, popular, 159.
Richmond, Va., foundation of, 55.
Rivers, solid deposits of, 53, 54.
——— Mr., on the Plum, cited, 138.
——— of North Britain, remarks concerning the, 161
Rock materials, 64.
Roses of Liverpool, 93.
Rozier, Abbé, 9, *n.*

S

St. Hilaire, G., quoted, 144.
Sansom, T., author of paper, 245; exhibitor, *ib.*
Satterthwaite, E., enrolled a member, 252.
Saunders, W. A. F., enrolled a member, 249.
Scarcity of Home-Grown Fruits in Great Britain; with remedial suggestions, 129.
Schiller, Johann Friedrich; his birth, 21; early education, *ib.*; early studies, 22; his first drama, "The Robbers," 23; his flight to Manheim, 25; his poverty, *ib.*; "Fiesco," *ib.*; "Cabal and Love," 26; becomes theatre-poet, *ib.*; goes to Leipzig, 27; his friendship with Körner, *ib.*; writes "Don Carlos," *ib.*; visits Weimar, 29; appointed to a professorship, 30; marries, *ib.*; his friendship with W. Von Humboldt, *ib.*; with Goethe, 31; "Wallenstein," 32; his illness, 33; "Mary Stuart," 34; "Maid of Orleans," 36; "William Tell," *ib.*; his death, 39; ballads and romances, *ib.*
Scolopendrium vulgare, 110.
Scolytes destructor, 213.
Scott, Sir W., quoted, 165; cited, 167, 173.
Shetland, Apples of, 130.
Silurian rocks, the, 57.
Simians, Anthropoid, the, enumerated, 142.
Sinnett F., donor, 240.
Sinodendron cylindricum, 210.
Smith, C. R., author of paper, 129, 256; donor, 245, 255
Smith, H. Ecroyd, enrolled a member, 253; exhibitor, 247, 250, 256.
Snakes, their profusion, 206.
Solinus, quoted, 130, *n.*
Somerville T., LL.D., enrolled a member, 244.
Spain, manners &c. of; many derived from ancient Rome, 2.
Squarey, A. T., enrolled a member, 252.
Stanley of Alderley, Sir F., letter from, 72.
Steele, Alex., Ph.Dr., enrolled a member, 247.
Steele, Sir Richard, anecdote of, 175.
Stone, G., enrolled a member, 238.
Strood cluster damson, the, 139.
Stuarts, the exiled, their last resting place, 200.
Sutton, T., author of paper, 241.
Sycamore, the, its insect enemies, 215.

T

Teeth of vertebrata, 44.
Telegraphs, electric, 225; their use in connection with meteorology, 227; table of results, 229.
Tipula, 209.
Threshing of corn by horses, 3, *n.*
Tortrix Viridana, 208.
Towson, J. T., chairman, 240; exhibitor, 241.
Trichomanes Radicans, 107.
Trilobite, the, 48.
Trochellium Scholæforme, 211.
Tucker, Edward, discoverer of the vine disease, 137, *n.*
Tundergarth kirk bells, 174.
Typical Quadrumana, The, 141.

V

Vine, the; culture of, 135; productiveness of, in England, *ib.*; limit of cultivation, 136; general remarks on, 137.
Vipers, their profusion, 206.
Virgil's Plough, 1.
Virgil, quoted, 3; *ib.*, *n.*; 15.
Voltaire, cited, 174.
Vossius, quoted, 10, *n.*

W

Wamphray, the lads of, 178, Note.
Warrington church, the timber eaten by insects, 221.
Waterhouse, N., author of paper, 97, 247; chair man, 249.
Whatham, W., enrolled a member, 238.
Wilkinson, T. T., author of paper, 115, 248; donor, 247.
Williams, Bell, enrolled a member, 245.
Wilson-Patten, Col., cited, 1.
Winkley, W., donor, 247.
Winn, Sir W. W., ready to join the Pretender, 188.
Witchcraft in Scotland, 174.
Woodsias, the, 111.
Woolfe, Mr., letters from, 184, 189, 193, 194, 196, 197, 198, 199.

Y

Yates, Mr., cited, 9.

FINIS.

Members (only) can now obtain the Volumes published by the Society at the following prices :—

Vols. I to XII	. . . . .	each 5s.*
Vols. XIII and XIV	. . . .	„ 7s. 6d.

* Except Vol. III, which cannot be supplied separately.

BINDING SECT. JUL 10 1968

DA
670
L19H6
v.15

Historic Socirty of
Lancashire and Cheshire,
Liverpool
Transactions

PLEASE DO NOT REMOVE
CARDS OR SLIPS FROM THIS POCKET

UNIVERSITY OF TORONTO LIBRARY